

**Technical Evaluation Memorandum  
for the Radiation Technology  
Superfund Site, Operable Unit 3  
Contract No. W912DQ-11-D3006**

**Site Number NJD047684451**

**December 2012**

**Prepared for:**

**USACE - Kansas City District**  
601 East 12th Street  
Kansas City, MO 64106

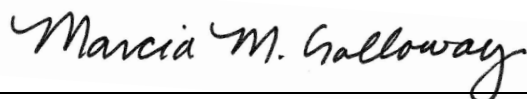
**Prepared by:**

**ECOLOGY AND ENVIRONMENT, INC.**  
368 Pleasant View Drive  
Lancaster, New York 14086

## Completion of Independent Technical Review

Project: Radiation Technology Incorporated (RTI) Superfund Site, Operable Unit 3 (OU3)  
Deliverable: Technical Evaluation Memorandum (Tech Memo)  
Revision and Date: Draft 12-03-2012

Ecology and Environment, Inc. has completed the above reference deliverable. Notice is hereby given that an independent technical review, that is appropriate to the level of risk and complexity inherent in the project, has been conducted as defined in the Contractor Quality Control Plan. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions; methods, procedures, and material used in analyses; alternatives evaluated; the appropriateness of data used and level obtained; and reasonableness of the result, including whether the product meets the customer's needs consistent with law and existing USACE policy. The independent technical review was accomplished by following signatories. All comments resulting from ITR have been resolved.



Independent Technical Review Team Leader

Date: 12/3/2012



Program Manager

Date: 12/3/2012

Significant concerns and the explanation of the resolution are as follows:

Item	Technical Concerns	Possible Impact	Resolutions
1	Section 1 and introduction to Section 3 makes various references to generic terms such as study area or project site. The text should be clarified to indicate the specific area that is being addressed. The areas should be clarified on the figures. Specific comments were included in the text.	Decision makers need to be clear on the relation of the historical data to the specific OU 3 areas.	Added more details in Sections 1 and 3 regarding the description for OU3 and areas included in OU3. Also added OU3 boundary to Figure 1-2.
2	The evaluation of the historical data does not address the usability of the data for the purpose of the FFS. The discussion is limited to specific reports and the results are assumed to be usable.	Areas may have been sampled previously but missing the specific parameters needed for FFS. This evaluation should be included in a future work plan but also needs to be stated here.	Additional clarification was added to the discussion in Section 3. Usability of analytical data included in the previous reports was not evaluated by E & E since the previous reports were submitted to EPA for review and ap-

**ITR Completion Form**

Item	Technical Concerns	Possible Impact	Resolutions
			proval.
3	Sample results were screened based on action levels in the previous reports. It is not clear if there are action levels for all parameters such as energetics, TOC or perchlorate.	If sample results did not have action levels or the action levels are not applicable to data needs for the FFS, results may be excluded from further evaluation.	Perchlorate is included as an energetic. Energetics had action limits listed in the Lockheed Martin SERAS 2010 report but were not included in the CRA 2010 report. No action limit was listed for TOC in the previous reports. Additional evaluation of the action levels will be performed during preparation of the work plan, if prepared.
4	The rationale for the list of recommended analysis was not clear. Samples from historical studies were analyzed for different parameter lists but correlation between historical parameters and recommended parameters is not clear. For example, it appears collection of concrete chip samples is related to evaluation of disposal of concrete. If so then specific samples and analysis should be listed for this purpose.	For purposes of the FFS analytical suites need to be established for specific data uses. If samples were not analyzed for those parameters than additional sampling may be warranted. This evaluation may be included in work plans but that needs to be stated here.	Decided not to include any recommendations for specific analyses in the Tech Memo, only included number of samples. Recommendations for specific analyses will be included in the work plan.

As noted above, all concerns resulting from independent technical review of the project have been considered.



Quality Control Manager

Date: 12/3/12

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## List of Abbreviations and Acronyms

AMSL	above mean sea level
ATK	Alliant Techsystems, Inc.
AST	aboveground storage tank
BNA	base, neutrals, and acid extractables
CRA	Conestoga-Rovers & Associates
CRCG	Cultural Resource Consulting Group
CRR	Cultural Resource Reconnaissance
E & E	Ecology and Environment, Inc.
ERT	Environmental Response Team
FFS	Focused Feasibility Study
Hartgen	Hartgen Archaeological Associates
mg/kg	milligrams per kilogram
µg/kg	micrograms per kilogram
NJDEP	New Jersey Department of Environmental Conservation
NRC	U.S. Nuclear Regulatory Commission
OU3	Operable Unit 3
P-2	Pump House 2
PA	Preliminary Assessment
PACM	potentially asbestos-containing material
PCB	polychlorinated biphenyls
PID	photoionization detector
ppm	part per million
RI	remedial investigation
RTI	Radiation Technology Incorporated
SVOC	semi-volatile organic compounds

## List of Abbreviations and Acronyms (cont.)

TAL	Target Analyte List
Tech Memo	Technical Evaluation Memorandum
Thiokol	Thiokol Chemical Corporation
TOC	total organic carbon
TS	total solids
TSI	thermal systems insulation
USACE KC	United States Army Corps of Engineers, Kansas City District
USEPA	United States Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compounds
YU	YU & Associates Incorporated

# 1

## Introduction

Ecology and Environment, Inc. (E & E) is pleased to provide the United States Army Corps of Engineers, Kansas City District (USACE KC) with this Technical Evaluation Memorandum (Tech Memo) on the Radiation Technology Incorporated (RTI) Superfund Site, Operable Unit 3 (OU3) Project. The RTI Superfund Site is situated in the western portion of Morris County, New Jersey, at 108 Lake Denmark Road in Rockaway Township. Although no large population center is adjacent to the RTI site, it is immediately northeast of the U.S. Military Picatinny Arsenal facilities, and directly northwest of Lake Telemark, a small residential community (see Figure 1-1). The RTI Superfund Site was used for testing and developing rocket engines and propellants. On-site operations also included radiation sterilization, production of architectural products, and hardwood flooring production. Waste drums containing solvents and other chemicals were improperly stored and disposed of.

The OU3 area consists of 34 building/structures in the P-2 Area (16 acres), East Stand Area (22 acres), and South Stand Area (27 acres) (see Figure 1-2). Previous sample locations (excluding asbestos and paint chip samples) are included on Figure 1-2. Previous investigations were completed of the groundwater (OU1) and groundwater contaminant sources (OU2-soils, sediment, and surface water). The reports documenting the investigation of the groundwater contaminant sources (OU2) surrounding the 34 building/structures comprising (OU3) were reviewed for data gaps, but OUs 1 and 2 will not be investigated as part of this scope. This investigation for OU3 (consisting of the buildings/structures in the East Stand Area, South Stand Area, and P2 Area) will determine if sampling of the buildings/structures is needed for potential demolition or reuse purposes (see Figure 1-2). This investigation also includes determining if data gaps exist for potential soil contamination located beneath or immediately adjacent to the buildings/structures, which would need to be addressed for preparation of a Focused Feasibility Study (FFS).

This Tech Memo was completed by E & E based on a site visit that was conducted on October 25 and 26, 2012, to observe site conditions associated with OU3, and the review of the following site reports and associated photo logs:

- Environmental Response Team Sampling Report (Lockheed Martin Technology Services/Environmental Services REAC 2005);

- Environmental Response Team Sampling Report (Lockheed Martin SERAS 2010);
- Phase 1A Cultural Resource Reconnaissance (CRCG 2007);
- Remedial Investigation Report, Operable Unit 2, Radiation Technology Inc. Superfund Site. (CRA 2010);
- East Stand Area Photo Log (2012);
- South Stand Area Photo Log (2012); and
- P2 Area Photo Log (2012).

The information and data in these reports were reviewed for each of the following:

- Surface soil contamination around each building/structure;
- Sub-slab soil contamination;
- Concrete contamination (concrete support structures/pads and building floors);
- Asbestos-containing materials;
- Lead paint;
- Cultural significance; and
- History/prior use of building/structure.

### **1.1 Purpose**

The purpose of this Tech Memo is to document the findings of the report reviews and site visit, and provide conclusions and recommendations regarding whether adequate information/data is available to complete a FFS. The FFS will be prepared to develop and evaluate alternatives to enable a cleanup action to be selected for the buildings/structures included in OU3.

E & E subcontracted the cultural significance portion of the background document review and Tech Memo to Hartgen Archaeological Associates (Hartgen). The asbestos-containing material and lead paint survey portions of the document review were subcontracted to YU & Associates Incorporated (YU). The cultural significance, asbestos-containing materials, and lead paint survey tech memos are summarized in the conclusions and recommendations section of this memo and are included as Appendix A and Appendix B, respectively.



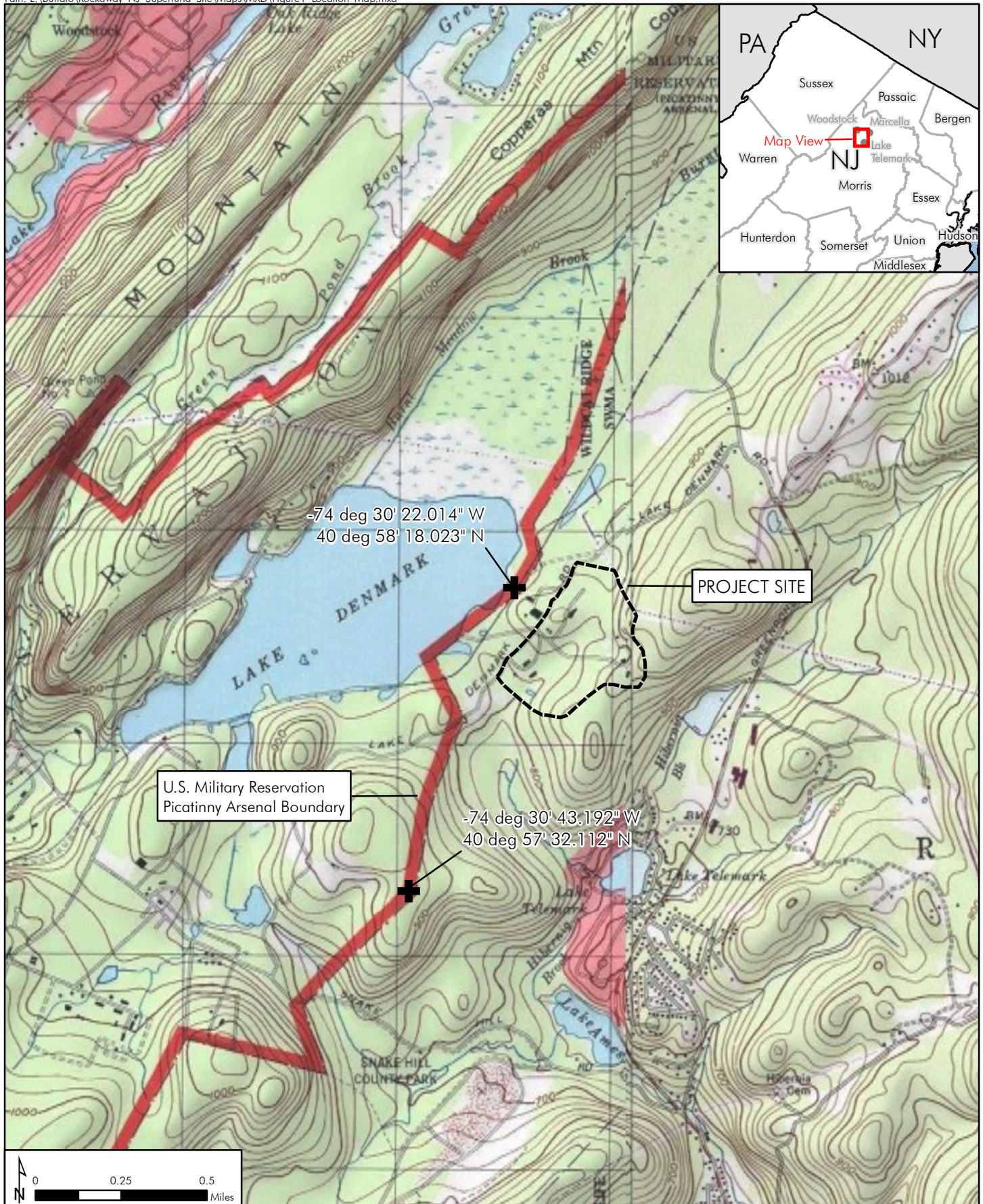


Figure 1-1  
 Site Location Map  
 Radiation Technology, Inc. Superfund Site  
 Rockaway Township, New Jersey



## **1.2 Site Description**

The former RTI site is located at 108 Lake Denmark Road, Rockaway Township, New Jersey (see Figure 1-1), near the small residential community of Lake Telemark, New Jersey, in the western portion of Morris County. The site consists of 263 acres of land and is divided into four portions: RTI Area (15 acres which is not included in OU3), East Stand Area (22 acres), South Stand Area (27 acres), and P2 Area (16 acres). The remaining portion (183 acres) consists of undeveloped land, also not included in OU3. The Site is generally considered light industrial and commercial. The four areas of the Site are currently fenced off and posted to restrict public access and most buildings on-site are in poor condition, having been vacant since 2006.

The area around the Site is generally low-density residential in nature. However, there has been significant residential and industrial development in the region. To the west and southwest of the Site, significant heavy industrial activities have been ongoing at the Picatinny Military Arsenal facilities since the early 1990s (see Figure 1-1). Areas to the east of the Site consist mainly of single-family residences.

## **1.3 Site History**

Prior to 1941, the RTI Superfund Site was owned by the Singer Manufacturing Company. Reaction Motors, Inc., purchased the property in 1941 and in approximately 1947 began the construction of facilities to support rocket engine and component testing programs. Reaction Motors, Inc., was acquired by a corporate predecessor to the Olin Corporation in 1953 and thereafter by Thiokol Chemical Corporation (Thiokol) in 1958. In 1964, Reaction Motors, Inc., was formally combined with Thiokol and became a separate working division within the company (CRA 2010). The 1991 Remedial Investigation (RI) Report provides a detailed summary of historic rocket motor related building use (Acres 1991).

In 1972, RTI purchased 15-acre parcel of the RTI Superfund Site (known as the RTI portion of the RTI Superfund Site) and conducted irradiation activities until it sold these operations in 1996. In 1978, RTI purchased the remaining 248 acres of the RTI Superfund Site from Thiokol and leased portions of the property to various tenants (CRA 2010).

In November 1999, RTI filed for Chapter 11 bankruptcy. As a result, the New Jersey Department of Environmental Protection (NJDEP) identified RTI as an unresponsive recalcitrant responsible party. After RTI declared bankruptcy, the NJDEP requested to have the United States Environmental Protection Agency (USEPA) assume oversight of the project, to which USEPA agreed in January 2001. Since declaring bankruptcy in 2000, there has been no financially solvent owner of the Site. Although RTI was no longer an active owner of the property, various tenants remained in the East Stand, South Stand, and P2 Areas until 2006, when the USEPA took control and evicted the tenants. The entire Site was designated as a Federal Superfund Site and the property was fenced off and

posted as such to prevent public access. As mentioned previously, Sterigenics International continues to occupy buildings on the RTI portion of the site (CRA 2010).

#### **1.4 Cultural Significance**

A Phase IA Cultural Resource Reconnaissance (CRR) was completed for the entire site (263 acres) by Cultural Resource Consulting Group (CRCG) for CRA in August and September 2006 (CRCG 2007) and is included as Appendix A. No archaeological testing was conducted. The CRR established whether any previously identified archaeological and/or historic architectural resources existed within the area of potential effects for the site, the sensitivity of the site to contain previously unidentified prehistoric and/or historic archaeological resources, and identifies any architectural resources over 50 years of age within the visual area of potential effects (CRCG 2007).

In respect to the area of site defined as OU3, the CRR concluded the following:

- The CRR concluded that the RTI area (not part of this scope) contains medium prehistoric sensitivity. The East Stand Area, P2 Area, and South Stand Area (OU3 area) contains low prehistoric sensitivity and disturbed/no prehistoric sensitivity. OU3 extends from Lake Denmark Road to the east (see Figure 1-1) in locations that are minimally disturbed to undisturbed, and on ground that contains gentle slope (CRCG 2007).
- The CRR concluded that information available at present is insufficient to determine the eligibility of the built resources on the site for inclusion on the National Register according to the significance criteria.
- Historic archaeological sensitive areas relating to the rocket development industry are located in the OU3 area which is directly associated with the Reaction Motors Incorporated and Reaction Motors Division facility operations. This includes extant buildings and structures used for research and testing. Also included in the district is the ancillary equipment (storage tanks, bunkers, and treatment-related facilities).
- The site is also situated in a historic mining district, and possibly contains prospecting mines (CRCG 2007).

In October 2012, Hartgen completed a site walkover with E & E to identify data gaps from the CRR. In November 2012, a technical evaluation memo titled Cultural Resources at the Radiation Technology OU3 Superfund Site was completed by Hartgen (see Appendix A) and is discussed in Section 4.

# 2

## Environmental Setting

### 2.1 Local Topography and Geology

The Site lies within the New Jersey Highlands, which is part of the Reading Prong of the New England physiographic province. The Reading Prong occurs in southeastern Pennsylvania in the southern parts of Lebanon, Berks, Lehigh, and Northampton counties. The Reading Prong consists of circular to linear, rounded low hills or ridges that project upward in significant contrast to the surrounding lowlands. The hills and ridges are made up of granitic gneiss, granodiorite, and quartzite. These rocks are very resistant to erosion and, thus, the hills and ridges stand higher than the softer sedimentary rocks that surround them. The slopes of these hills and ridges are steep and have a very well defined change in slope where the bases of the hills and ridges meet the lower and gentler slopes of adjacent sections of land. The streams eroding into the hills and ridges are short and steep. Local relief is 300 to 600 feet and elevations range from 140 to 1,364 feet (PADCNr 2012).

The topography across the area is generally characterized by northeastward trenching ridges and parallel valley features with interspersed lakes. Elevations range from approximately 500 feet above mean sea level (AMSL) to about 1,000 feet AMSL (USGS 2012).

The topography of the New Jersey Highlands is the result stream erosion due to the structure and lithologic character of the bedrock. However, topography also reflects Pleistocene glaciation. A terminal moraine of the Wisconsinan glaciation is situated in the central portion of Morris County, New Jersey. This moraine forms a belt, which is approximately 2 to 3 miles wide and roughly parallel to the Rockaway River (CRA 2010). North of the moraine, the topography reflects terrain typically associated with glacial outwash valleys filled with alluvium and sparse rock exposures.

The geology of the region is very complex. A rugged topography and the surficial bedrock exposures partially reveal the chaotic structure of the region, although the true character of the subsurface is difficult to determine. It is believed that a series of gently eastward dipping thrust faults occur in the region due to compression-style deformation during the Acadian and Alleghenian Orogenies and extension-style deformation during the development of the Early Mesozoic rift basins played a role (USGS 2012).

Three geologic units are found at the Site: glacial overburden, saprolite, and bedrock. The overburden is up to 20 feet thick. It is described as an unstratified sandy loam deposit composed of brown sand with some silt along with little clay and gravel, and occasional boulders (USDA 2010). The overburden is underlain by extremely weathered bedrock called saprolite. This chemically weathered bedrock which maintains the structure of the original rock is found between the overburden and bedrock and is generally up to 22 feet thick (Sims and Buddington 1958; USDA 1976). Bedrock at the site consists of a wide variety of igneous rocks, migmatites, and intrusive igneous rocks. It is primarily Precambrian age medium- to coarse-grained granitic gneiss. It is generally massive, dense, and moderately fractured (Sims and Buddington 1958; USDA 1976).

## **2.2 Hydrogeology**

There are two aquifers beneath the Site that are separated by the northeast-southwest bedrock ridge along Lake Denmark Road. West of the ridge, groundwater flows toward Lake Denmark in all the geologic units. East of the ridge, groundwater flows toward a low lying center before flowing off-site to the south (CRA 2010). In this eastern portion, groundwater is primarily found within bedrock. Groundwater flow is reflective of the topography of the region and can flow radially from topographic highs, such as that which has been observed in the P2 Area (CRA 2010). The South Stand and East Stand Areas are low lying and represent groundwater recharge areas.

The surficial aquifer is found within the overburden and saprolite units, while the deep groundwater system is found within bedrock. However, these separate aquifers are hydraulically connected. The surficial groundwater system exists primarily in the western portion (RTI Area) of the site. The surficial system is directly underlain by the deep groundwater system. The deep groundwater system exists across the entire site and at some locations (P2 Area) it is the only system present. Surficial and deep groundwater flows westward in the RTI Area toward Lake Denmark. Lake Denmark appears to be a groundwater discharge source for the saprolite (surficial) and shallow bedrock (deep) groundwater systems (CRA 2010). Based on topography, the deep bedrock groundwater flows in a westward direction, potentially underneath Lake Denmark, towards the Picatinny Military Arsenal. The influence of fractures on bedrock groundwater flows become more pronounced with depth. The upper portions of the bedrock have an overall higher permeability due to weathering and erosion (CRA 2010).

## **2.3 Surface Hydrology**

Lake Denmark to the west of the Site is a major surface water feature in the vicinity of the project area. Fed by Burnt Meadow Brook, Lake Denmark is a man-made lake that flows into Picatinny Lake and then into the Rockaway River (CRA 2010). Other surface water features exist within the vicinity of the Site as well. Surface waters within the vicinity of the Site are classified as FW2-TM(C1) (freshwater other than Pinelands waters, trout maintenance, category 1) (NJDEP 2012).

# 3

## Relevant Previous Investigations Summary and FFS Data Gaps

Numerous investigations related to the OU1 and OU2 investigations have been conducted on all portions of the RTI property dating back to 1980. No investigations have been conducted for OU3. The following investigations were included in the four reports reviewed by E & E for this Tech Memo.

- **March and April 2005:** USEPA Region 2 and the EPA/Environmental Response Team (ERT) completed a multi-media sampling of paint chips, potentially asbestos-containing material (PACM), and soil (Lockheed Martin Technology Services/Environmental Services REAC 2005).
- **August – September 2006:** ATK commissioned a Phase IA Cultural Resource Reconnaissance Survey (CRCG 2007).
- **September – November 2008:** Conestoga-Rovers & Associates (CRA) conducted two phases of an RI at the RTI Site. Subject media included soil, sediment, surface water, and tank contents (CRA 2010).
- **January – April 2010:** USEPA Region 2 and the EPA/ERT completed further sampling to generate site-specific contaminant data. Sampling included selected buildings for asbestos, lead paint, and other contaminants and utility poles for polychlorinated biphenyls (PCBs) (Lockheed Martin SERAS 2010).

The OU3 area consists of 34 building/structures in the P2 Area, East Stand Area, and South Stand Area see Table 3-1. The historical use of each building/structure listed on the table was derived from the four reports reviewed by E & E. The current use of each building/structure listed on the table was derived from the October 2012 site walkover conducted by E & E.

Previous investigations from each of these areas have been reviewed to determine if data related to OU3 was included in the investigations. The usability of the data was not reviewed by E & E since the data was previously submitted and accepted by the EPA. The samples located near each of the 34 buildings/structures in OU3 were included on the Summary of Previous Sampling Results sheets for the P2 Area, South Stand Area, and East Stand Area included in Appendix C. These

### 3 Relevant Previous Investigations Summary and FFS Data Gaps

sheets include lead and asbestos samples with a result greater than zero. The sheets also include exceedances for samples from CRA 2010 greater than the New Jersey Department of Environmental Protection (NJDEP) Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and the UPL95 Background Reference (10 background soil samples analyzed for TAL Metals). The sheets also include exceedances for samples from Lockheed Martin SERAS 2010 with action levels taken from the Remedial Investigation/Feasibility Study Work Plan-OU2 by CRA (CRA 2008).

**Table 3-1 List of Structures/Buildings Located in OU3, Radiation Technology Superfund Site, Rockaway Township, New Jersey**

OU3		
Buildings/Structures	Current Description	Historical Use
<b>P2 Area</b>	<b>Densely wooded</b>	
R-47	R-47 is an unoccupied large building/warehouse (approximately 190 by 74 feet) with galvanized sheet metal, steel framing, and utilities. R-47 contained six rocket fueling bays with an overhead crane and tracks which were used to move the rockets. It was also used for rocket motor assembly, and later fiberglass boat manufacturing, machine shop, and auto restoration. An AST (possibly a heating oil tank) was observed on the west side of the building.	Used as a rocket fueling station for the Bullpup B rocket. Contains six rocket fueling bays. Overhead crane and tracks to move the rockets. Rocket motor assembly, leased later to fiberglass boat manufacturer, used as a machine shop, auto restoration.
Paint Locker	The paint locker is an unoccupied small building (approximately 35 by 15 feet) with insulated concrete block walls and a metal roof.	Paint locker
Fuel Storage Area	The fuel storage area is currently concrete foundation, no tanks were observed.	Fuel storage tank.
Ignitor Storage	The ignitor storage bunker is an unoccupied small building (24 by 12 feet) with steel siding and a metal frame.	Ignitor storage bunker.
Acid (Oxidizer) Storage Tank	The acid (oxidizer) storage tank area currently only contains a concrete containment area (30 feet by 30 feet, approximately 3 feet high) filled with debris. The floor of the containment area could not be observed, and may be either concrete or soil.	Acid (oxidizer) storage tank.
Pump House 2 (P-2)	The Pump House 2 (P-2) is an unoccupied small building (12 by 24 feet) with steel siding and metal frame. It also contains a medium sized tank.	Water pump house.
R-43	R-43 is an unoccupied collapsed Quonset hut filled with debris (16 by 32 feet).	No description available.

### 3 Relevant Previous Investigations Summary and FFS Data Gaps

**Table 3-1 List of Structures/Buildings Located in OU3, Radiation Technology Superfund Site, Rockaway Township, New Jersey**

OU3		
Buildings/Structures	Current Description	Historical Use
R-34	R-34 is an unoccupied building (approximately 80 by 75 feet) consisting of a combination of concrete block and sheet metal.	Used to test diesel engines. Previous reports stated mufflers exited the roof, could mean that two diesel test stands existed.
<b>South Stand Area</b>	<b>Densely wooded</b>	
Test Stand 12	Test Stand 12 is an unused multi-story concrete and steel structure (approximately 100 by 40 feet) with two test bays and a control room with a floor drain.	Rocket motor test stand.
S-46	S-46 is an unoccupied, medium-sized (120 by 40 feet) warehouse consisting of concrete block and a metal roof. An empty AST is present on the ground south of the building.	Boiler house, equipment storage, machine shop and offices. Most recently used to repair and maintain small engine equipment such as lawn mowers. Asbestos visible in 2010.
Test Stand 11	Test Stand 11 is an unoccupied concrete and steel structure (approximately 45 by 25 feet) with three test bays. A shed surrounded by 8 by 10 feet chain link fencing is also located northeast of the test stand.	Rocket motor test stand.
Test Stand 37	Test Stand 37 is an unoccupied concrete and steel structure (approximately 45 by 40 feet) with three test bays.	Solid motor mixing and casting.
Propane Storage Area	The Propane Storage Area is an unoccupied chain-link fenced area (22 feet by 31.5 feet) with piping and a concrete slab over the entire area. All propane tanks have been removed.	Propane storage area.
No. 1 Sewage Treatment Plant	The No. 1 Sewage Treatment Plant is an unused separator chamber and effluent tank (approximately 37 by 15 feet).	Sewage treatment plant.
S-48	S-48 is a bare concrete pad (approximate 30 by 40 feet). The building was removed sometime after 2005.	Equipment storage. Used as a lawnmower repair/salvage shop, and a private automotive repair garage.
T-50	T-50 is a bare concrete pad approximately 15 by 30 feet.	No description available.
S-49	S-49 is currently a pile of debris. It contains concrete/cinderblock remains for the exhaust tank and potentially underground cisterns.	Exhaust tank with underground cisterns.



### 3 Relevant Previous Investigations Summary and FFS Data Gaps

**Table 3-1 List of Structures/Buildings Located in OU3, Radiation Technology Superfund Site, Rockaway Township, New Jersey**

OU3		
Buildings/Structures	Current Description	Historical Use
<b>East Stand Area</b>	<b>Densely wooded</b>	
Test Stand 2 (R-2)	Test Stand 2 (R-2) is a large (approximately 50 by 75 feet) concrete and steel structure, approximately 30 feet high on the southwest side, with one rocket motor test bay. The test stand contains corrugated galvanized pipes (approximately 3-foot diameter) on each side going through the concrete structure.	Large size motor test stand.
R-33	R-33 is a small (approximately 9 by 12 foot), insulated galvanized sheet metal building with steel framing, utilities, and an air vent built into the roof. A 3 by 8 foot concrete pad, possibly used for an AST, is located adjacent to R-33. This building had evidence of a recent fire inside.	No description available.
R-29	R-29 is an empty storage building that contains paper debris and 5.5-inch floppy disks. The building (approximately 20 by 40 feet) is galvanized sheet metal with steel framing, and utilities.	Used primarily for miscellaneous storage/document storage.
R-21	R-21 is a concrete block building (approximately 60 feet by 70 feet), which was built into the hillside on the north and east sides. R-21 contains miscellaneous debris including approximately 30 drums/containers (55-, 30- and 5-gallon) in a room at the southern corner of the building. Elevated photoionization detector readings (5 ppm) in ambient air were measured at the entrance to the room containing the drums. A concrete AST saddle is located on south side of building, although the AST has been removed.	Instrument center/boiler house/sewage treatment control center.
Pump House 3 (P-3)	Pump House 3 (P-3) is an unoccupied shed (8 feet by 8 feet) containing piping, electrical, and two water tanks (60 gallons each). The shed is constructed of 2 feet by 4 feet fiberboard panels with a corrugated metals outer surface.	Water pump house.
Test Stand 3 (R-3)	Test Stand 3 (R-3) contains one concrete test bay. Two abandoned ASTs were observed lying on the ground on the north side of the structure.	Rocket motor test stand with exhaust scrubber/effluent treatment.



### 3 Relevant Previous Investigations Summary and FFS Data Gaps

**Table 3-1 List of Structures/Buildings Located in OU3, Radiation Technology Superfund Site, Rockaway Township, New Jersey**

OU3		
Buildings/Structures	Current Description	Historical Use
Pump House 4 (P-4)	Pump House 4 (P-4) is an unoccupied shed (10 feet by 12 feet) consisting of galvanized sheet metal with steel framing and utilities. No pump was observed during the site walkover.	Water pump house.
R-51 (includes T-51)	R-51 is a metal building which is empty except for office space remains, and piping from the fuel oil AST to the south. The fuel oil AST is 12-foot diameter, 16-foot-tall and surrounded by an earthen berm, adjacent to R-51.	Boiler house for R-4 activities, and associated fuel oil tank (T-51).
Test Stand 4 (R-4)	Test Stand 4 (R-4) is a large building with galvanized sheet metal steel, framing, and utilities. Test Stand 4 (R-4) was used for testing of developmental engines, which used mixed hydrazine and nitrogen tetroxide. Remnants of instrumentation, one large rocket motor test room, four moderate size test rooms with drainage troughs discharging outside the building, and two small laboratories were observed during the site walkover. In addition, a 5-gallon bucket half full of what appears to be waste oil is located in one of the small laboratories.	Rocket motor test stand with altitude test chambers.
Cistern/Cistern Pump	The Cistern/Cistern Pump consists of two, 6-foot diameter concrete lids on buried vaults adjacent to a 4-foot by 6-foot concrete slab. These vaults were observed to be filled with water during the site walkover.	No description available
No. 2 Sewage Treatment Plant	The No. 2 Sewage Treatment Plant consists of a separator chamber and effluent tank.	Sewage treatment.
Scrubber	The scrubber is unused and only a bare concrete foundation remains. The scrubber collected material from rocket tests performed at Test Stand (R-3). The material would have passed through the scrubber, into what appears to be a settling basin with an overflow that ultimately discharged to the west through an opening.	Scrubber building designed to clean exhaust gases from test firings of rocket motors.
Water Cooling Tower	The Water Cooling Tower is a wooden structure with two large fans on the roof and a concrete foundation.	Water cooling tower.

### 3 Relevant Previous Investigations Summary and FFS Data Gaps

**Table 3-1 List of Structures/Buildings Located in OU3, Radiation Technology Superfund Site, Rockaway Township, New Jersey**

OU3		
Buildings/Structures	Current Description	Historical Use
Condenser and Hot well	The Condenser and Hot Well consists of a concrete settling basin with one large chamber that overflows into a second smaller chamber, which has an opening that allowed discharge to the surface. The condenser and hot well received fluids from Test Stand 4 (R-4), which were carried in above ground piping (removed) to the structure.	Condenser and hot well.
Transformer Bank	All that remains of the Transformer Bank is a chain-link fence approximately 25 feet by 15 feet (three sides). Power poles are located adjacent to the fenced area and one power pole is also located inside fenced area. No concrete pads or transformer support structures were observed within the fenced area during the site walkover.	Transformer bank.
Agitator and Effluent Treatment Basin	The Agitator and Effluent Treatment Basin includes a small building (10 by 10 feet) with a lower basin (22 by 30 feet). The lower basin is surrounded by 3-foot concrete wall with a concrete overflow that discharges to the east.	No description available.
Waste Disposal Area	The Waste Disposal Area is located approximately 150 feet east of R-47. The area is situated in the woods and contains miscellaneous debris including an empty rusted 55 gallon drum, metal debris, and metal piping.	Waste disposal.

Data gaps to determine if the buildings/structures located in OU3 were to be reused or demolished, and if additional data was needed for disposal purposes was based on review of previous site reports, associated photo logs, and a site visit conducted by E & E on October 25 and 26, 2012 to observe site conditions associated with OU3. Photographs taken by E & E of the buildings/structures during the site walkover are included in Appendix D. Previous sample locations (excluding asbestos and paint chip samples) are included on Figure 1-2.

#### 3.1 P2 Area

The P2 Area consists of eight buildings/structures listed in Table 3-1. Of these eight buildings/structures, seven of them have had both indoor and/or outdoor samples previously collected. The previous investigation summaries, data gaps and E & E recommendations to satisfy them are summarized below.

### **3 Relevant Previous Investigations Summary and FFS Data Gaps**

#### **3.1.1 R-47**

R-47 is an unoccupied large building/warehouse (approximately 190 by 74 feet) with galvanized sheet metal, steel framing, and utilities. It was historically used as a rocket fueling station for the Bullpup B rocket. R-47 contained six rocket fueling bays with an overhead crane and tracks that were used to move the rockets. It was also used for rocket motor assembly, and later fiberglass boat manufacturing, machine shop, and auto restoration. An AST (possibly a heating oil tank) was observed on the west side of the building.

#### **Previous Investigations Summary**

Sub-slab soil samples (R-47B and R-47C) (see Figure 1-2) were collected by Lockheed Martin (Lockheed Martin SERAS 2010) from two of the six fueling bays by coring. Sample (R-47A) was collected during the same investigation from a trough to the northwest of the fueling bays. The samples were analyzed for Target Analyte List (TAL) metals, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and energetics. Concentrations exceeded their respective action levels in several metals and three SVOCs in all three locations. Arsenic had a concentration of 4.1 mg/kg in R-47B, which is more than 10 times the action level at 0.39 mg/kg (Lockheed Martin SERAS 2010). Iron had a concentration of 20,900 mg/kg in R-47B, which is more than nine times the action level at 2,300 mg/kg (Lockheed Martin SERAS 2010). Manganese had a concentration of 606J mg/kg in R-47B, which is more than three times the action level at 180 mg/kg (Lockheed Martin SERAS 2010). Benzo(a)pyrene had a concentration of 440J ug/kg, which is more than 7 times the action level at 62 ug/kg (Lockheed Martin SERAS 2010). Results are included in the Summary of Previous Sampling Results sheets in Appendix C.

A total of six samples (315-10 through 315-15) were collected for PACM by Lockheed Martin consisting of tiles, mastic, pipe insulation and thermal bricks from what appeared to be some type of furnace adjacent to the building (Lockheed Martin Technology Services/Environmental Services REAC 2005). Five of the six samples contained chrysotile (4% to 12%), which are included in the Summary of Previous Sampling Results sheets in Appendix C.

Two paint chip samples (R-47 Wall and R-47 Door Jam) were collected and analyzed for lead by Lockheed Martin. The samples contained lead at concentrations of 840 milligrams per kilogram (mg/kg) and 1,100 mg/kg, respectively. Two surface soil samples (UP-3 and UP-4) (see Figure 1-2) were collected from beneath electrical transformers and analyzed for PCBs. Both samples contained concentrations of Aroclor 1254 at 1,000 micrograms per kilogram (µg/kg) and 110 µg/kg; respectfully, which are included in the Summary of Previous Sampling Results sheets in Appendix C. Paint chips and PACM were not collected from the shed located behind R-47. The shed contained boxes labeled “Rad-nuts” (Lockheed Martin Technology Services/Environmental Services REAC 2005).

### **3 Relevant Previous Investigations Summary and FFS Data Gaps**

A total of six surface soil samples (SS50 through SS53, SS59, and SS60) (see Figure 1-2) were collected in the P2 Area (near R-47) from 0 to 1 foot below ground surface by CRA (CRA 2010). These samples were analyzed for VOCs, SVOCs, energetics, metals, pH, total solids (TS), and total organic carbon (TOC). Mercury (0.10J mg/kg) and cadmium (1.1J mg/kg) were the only metals detected at concentrations exceeding their respective action levels. Results are included in the Summary of Previous Sampling Results sheets in Appendix C.

#### **Data Gaps**

Although several samples were collected from this building, samples were not collected near the above ground fuel storage tank (AST). Therefore, E & E proposes to collect a grab surface soil sample (0 to 6 inches deep) beneath the AST on the northwest side of the building to determine if the soil beneath has been adversely impacted.

Recommend removal of four drums (three contain petroleum products and one contains an unknown liquid) located inside the building. All of these drums had elevated photoionization detector (PID) readings (ranging from 15 ppm to up to 90 parts per million [ppm]) above the background readings of 0 ppm. Three of the drums were labeled, but the fourth drum did not contain a label, therefore, this drums needs to be sampled or hazard categorized prior to disposal. Two of the drums have leaked onto the floor, therefore, E & E recommends collecting two concrete chip samples inside the building near the drums, and one from the south end for general characterization of the building floor (0 to 1 inch deep) for estimating disposal costs/options in the FFS.

There is a possible UST outside the boiler room on the northwest side of the building, based on the presence of what appears to be a vent pipe sticking out of the ground. E & E recommends using a metal detector to determine if an underground storage tank (UST) is present, and/or hand excavating around the vent pipe to help verify the presence or absence of a tank. If an UST is located, E & E recommends sampling of the tank's contents.

#### **3.1.2 Paint Locker**

The paint locker is an unoccupied small building (approximately 35 by 15 feet) with insulated concrete block walls and a metal roof.

#### **Previous Investigations Summary**

The surface soil samples (SS56 and SS57) (see Figure 1-2) were collected by CRA to provide information on potential impacts to soil due to operations associated with the former paint locker area (CRA 2010). The samples were analyzed for metals, VOCs, SVOCs, energetics, pH, TS, and TOC. A concentration of mercury exceeded the respective action level at 0.61 mg/kg in SS56 which is more than six times the NJDEP Impact to Groundwater Soil Remediation action level at 0.1 mg/kg (CRA 2010). The results are included in the Summary of Previous Sampling Results sheets in Appendix C.

### **3 Relevant Previous Investigations Summary and FFS Data Gaps**

#### **Data Gaps**

Due to the absence of significant contamination in the three soil samples previously collected around the building and no evidence of spills noted during the inspection, no additional sampling is recommended.

#### **3.1.3 Fuel Storage Area**

The fuel storage area is currently concrete foundation, no tanks were observed.

#### **Previous Investigations Summary**

The surface soil samples (SS54 and SS55) (see Figure 1-2) were collected by CRA to provide information on potential impacts to soil due to the operation of a former 4,000-gallon mixed amine fuel aboveground storage tank (AST)(CRA 2010). The samples were analyzed for energetics, pH, TS, and TOC. No concentrations exceeded their respective action levels and are included in the Summary of Previous Sampling Results sheets in Appendix C.

#### **Data Gaps**

Due to the absence of contamination in the two soil samples previously collected around the building, and no evidence of spills noted during the inspection, no additional sampling is recommended.

#### **3.1.4 Ignitor Storage Bunker**

The ignitor storage bunker is an unoccupied small building (24 by 12 feet) with steel siding and a metal frame.

#### **Previous Investigations Summary**

Surface soil samples (SS62 and SS63) (Figure 1-2) were collected by CRA to provide information on potential impacts to soil due to the operations associated with the ignitor storage bunker (CRA 2010). The samples were analyzed for energetics, metals, pH, TS, and TOC. No concentrations exceeded their respective action levels and are included in the Summary of Previous Sampling Results sheets in Appendix C.

#### **Data Gaps**

Due to the absence of contamination in the two soil samples previously collected around the building, and no evidence of spills noted during the inspection, no additional sampling is recommended.

#### **3.1.5 Acid (Oxidizer) Storage Tanks**

The acid (oxidizer) storage tank area currently only contains a concrete containment area (30 feet by 30 feet, approximately 3 feet high) filled with debris. The floor of the containment area could not be observed, and may be either concrete or soil.

#### **Previous Investigations Summary**

Samples were not collected from the acid (oxidizer) storage tanks during previous investigations.

### **3 Relevant Previous Investigations Summary and FFS Data Gaps**

#### **Data Gaps**

The storage tanks have been removed and are assumed to have been ASTs (due to the presence of a containment wall). Pipes in the northeast corner of the containment area appear to be water and chemical lines. E & E recommends collecting one surface soil sample from near the pipes.

The containment area is currently filled with debris (predominantly plastic waste), which appears to be from the “Rad” nut and bolt manufacturing process. Further investigation of this debris (hand digging) is recommended to investigate the presence of potential hazardous materials. E & E proposes to collect two surface soil samples within the containment, and two concrete chip samples (if a concrete floor exists) for general characterization purposes and for use in the FFS.

#### **3.1.6 Pump House 2 (P-2)**

The Pump House 2 (P-2) is an unoccupied small building (12 by 24 feet) with steel siding and metal frame. It also contains a medium sized tank. It was historically used as a water pump house.

#### **Previous Investigations Summary**

No samples were collected inside this building. However, a transite pipe lying on the ground located approximately 30 feet outside of the Pump House (P-2) (see Figure 1-2) was sampled for PACM by Lockheed Martin (Lockheed Martin Technology Services/Environmental Services REAC 2005). The PACM sample contained 25% chrysotile and is included in the Summary of Previous Sampling Results sheets in Appendix C.

#### **Data Summary**

This building was used as part of the facility’s water system. It contains a vertical water tank (possibly a chlorinator) and electrical equipment. Based on previous/current use and the absence of stains, no additional sampling is recommended.

#### **3.1.7 R-43**

R-43 is an unoccupied collapsed Quonset hut filled with debris (16 by 32 feet). There is no historical use listed for this building in previous reports.

#### **Previous Investigations Summary**

One paint chip sample (R-43 outer door) was collected from an exterior door for lead analysis by Lockheed Martin. The sample contained lead at a concentration of 89,000 mg/kg, which was the highest lead concentration of any of the lead samples collected (Lockheed Martin Technology Services/Environmental Services REAC 2005). One surface soil sample (UP-2) was collected beneath the transformer and analyzed for PCBs (see Figure 1-2). The sample did not contain any concentrations above the respective action level. A surface/subsurface soil sample (SB50) was collected and analyzed for energetics, VOCs, SVOCs, metals, pH, TOC, and TS. Mercury, antimony, and cadmium concentrations exceeded



### **3 Relevant Previous Investigations Summary and FFS Data Gaps**

their respective action levels. SB50 had a concentration of mercury at 4.5 mg/kg which is more than 40 times the NJDEP Impact to Groundwater Soil Remediation action level at 0.1 mg/kg (CRA 2010). Results are included in the Summary of Previous Sampling Results sheets in Appendix C.

#### **Data Summary**

This collapsed hut contains trash and an empty 30-gallon drum that appears to have contained a petroleum product. A previous soil sample (SB50) outside the north side of the building contained metals, with an elevated level of mercury (4.5 mg/kg). Based on observations, the floor inside the building is believed to be asphalt. E & E recommends collection of a soil sample beneath the asphalt from the center of the building for general characterization purposes and for use in the FFS.

#### **3.1.8 R-34**

R-34 is an unoccupied building (approximately 80 by 75 feet) consisting of a combination of concrete block and sheet metal. It was historically used to test diesel engines. Previous reports stated that mufflers exited the roof, which indicated that two diesel test stand rooms existed.

#### **Previous Investigations Summary**

Both diesel engine test stand rooms were cored and sampled (R-34A and R-34B) (see Figure 1-2) by Lockheed Martin. R-34B was collected beneath a fracture in the foundation (Lockheed Martin SERAS 2010). Both sub-slab samples were analyzed for metals, VOC, energetics, and SVOCs. Both samples contained concentrations exceeding their respective action levels in several metals, and two SVOCs. Arsenic had a concentration of 3.6 mg/kg in R-34A, which is more than nine times the action level at 0.39 mg/kg (Lockheed Martin SERAS 2010). Iron had a concentration of 20,400 mg/kg in R-34A, which is more than eight times the action level at 2,300 mg/kg (Lockheed Martin SERAS 2010). Benzo(a)pyrene had a concentration of 440J ug/kg in R-34A, which is more than six times the action level at 62 ug/kg (Lockheed Martin SERAS 2010). Results are included in the Summary of Previous Sampling Results sheets in Appendix C.

A total of five samples (315-05 through 315-09) were collected by Lockheed Martin for PACM consisting of tiles, mastic, and window glaze (Lockheed Martin Technology Services/Environmental Services REAC 2005). Four of the five samples contained chrysotile (4% to 12%) and one of the samples (315-09) contained 4% anthophyllite and results are included in the Summary of Previous Sampling Results sheets in Appendix C.

Two paint chip samples (R-34 Door Jam and R-34 Wall) were collected by Lockheed Martin and analyzed for lead (Lockheed Martin Technology Services/Environmental Services REAC 2005). Both samples contained lead at concentrations of 2,600 mg/kg and 680 mg/kg, respectively. One surface soil sample (UP-2) was collected beneath a transformer and analyzed for PCBs. The

### **3 Relevant Previous Investigations Summary and FFS Data Gaps**

sample did not contain any PCBs. All samples are included in the Summary of Previous Sampling Results sheets in Appendix C.

Two surface and subsurface samples (SB50 and SB52) were also collected on the east and west sides of R-34 by CRA (CRA 2010). The samples were analyzed for VOCs, SVOCs, energetics, metals, pH, TOC, and TS. Sample SB50 contained concentrations that exceeded the respective action levels for mercury, antimony, and cadmium. Mercury had a concentration of 4.5 mg/kg, which is 45 times more than the NJDEP Impact to Groundwater Soil Remediation action level at 0.1 mg/kg (CRA 2010). Results are included in the Summary of Previous Sampling Results sheets in Appendix C.

#### **Data Gaps**

Several samples were collected in and around this building (several paint chips and floor tile samples in the building, two soil borings beneath the building slab, and two soil borings outside the building). The paint contains lead, and the floor tiles contain asbestos. The soils beneath the slab have metals and PAHs and one of the soils outside the building (east side) has an elevated level of mercury (4.5 mg/kg). Since the building was used to test diesel engines, E & E recommends collecting two concrete chip samples inside the building for disposal purposes and for use in the FFS.

### **3.2 South Stand Area**

The South Stand Area consists of nine buildings/structures listed in Table 3-1. Of these nine buildings/structures, six of them have had both indoor and/or outdoor samples from samples previously collected from these structures/buildings. The previous investigation summaries, data gaps, and E & E recommendations to satisfy them are summarized below.

#### **3.2.1 Test Stand 12 (S-12)**

Test Stand 12 is an unused multi-story concrete and steel structure (approximately 100 by 40 feet) with two test bays and a control room with a floor drain. It was historically used as a rocket motor test stand.

#### **Previous Investigations Summary**

Two surface and subsurface soil samples (SB71 and SB72) (see Figure 1-2) were collected by CRA and analyzed for VOCs, SVOCs, energetics, metals, pH, TS, and TOC (CRA 2010). Several metals were detected at concentrations that exceeded their respective action levels. Cadmium had a concentration of 4.8 mg/kg and 2.4 mg/kg in SB71 and SB72, respectively, which is more than twice the NJDEP Impact to Groundwater Soil Remediation action level at 1 mg/kg (CRA 2010). Results are included in the Summary of Previous Sampling Results sheets in Appendix C.

#### **Data Gaps**

This former test stand had four soil samples collected around it but no samples were collected from the ground between the two test stand bays, and none were



### **3 Relevant Previous Investigations Summary and FFS Data Gaps**

collected within 35 feet of the structures. Recommend collecting two concrete chip samples (0 to 1 inch) from the walls/roof for disposal purposes and for use in the FFS. E & E recommends collecting two surface soil samples from the ground between the two test stand bays if there is soil present, or concrete chip samples if concrete is in this area. These samples will be used for general characterization purposes and for use in the FFS.

#### **3.2.2 S-46**

S-46 is an unoccupied, medium-sized (120 by 40 feet) warehouse consisting of concrete block and a metal roof. It was historically used as a boiler house, equipment storage, machine shop, and offices. Previous reports stated that it was most recently used to repair and maintain small engine equipment, such as lawn mowers. An empty AST is present on the ground south of the building.

#### **Previous Investigations Summary**

Two sub-slab soil samples were collected (S-46A and S-46B) (see Figure 1-2) from inside S-46 by Lockheed Martin. Sample S-46B was located near a floor drain (Lockheed Martin SERAS 2010). The samples were analyzed for TAL metals, VOCs, SVOCs, and energetics. Concentrations exceeded their respective action levels in several metals and a total of three SVOCs in both locations. Arsenic had a concentration of 8.5 mg/kg in S-46B, which is more than 20 times the action level at 0.39 mg/kg (Lockheed Martin SERAS 2010). Iron had a concentration of 72,300 mg/kg in S-46B, which is more than 31 times the action level at 2,300 mg/kg (Lockheed Martin SERAS 2010). Benzo(a)pyrene had a concentration of 500 µg/kg in S-46B, which is more than 8 times the action level at 62 µg/kg (Lockheed Martin SERAS 2010). Results are included in the Summary of Previous Sampling Results sheets in Appendix C.

A total of three surface and subsurface soil samples (SB62 through SB64) were collected around the building by CRA and analyzed for VOCs, SVOCs, energetics, metals, pH, TS, and TOC (CRA 2010). Aluminum was the only metal detected at concentrations exceeding the respective action level in SB63 and SB64 at 19,900 mg/kg and 18,400 mg/kg, respectively. These concentrations are more than four times the NJDEP Impact to Groundwater Soil Remediation action level at 3,900 mg/kg (CRA 2010). Results are included in the Summary of Previous Sampling Results sheets in Appendix C.

#### **Data Gaps**

E & E recommends disposing the empty AST on the side of the road that may have contained fuel oil. E & E recommends collecting a soil sample beneath the AST and collecting a sample of the contents (if the AST is not empty) for general characterization purposes and for use in the FFS. Also collect two concrete chip surface samples from the floor for FFS disposal purposes.

### **3 Relevant Previous Investigations Summary and FFS Data Gaps**

#### **3.2.3 Test Stand 11 (S-11)**

Test Stand 11 is an unoccupied concrete and steel structure (approximately 45 by 25 feet) with three test bays. A shed surrounded by 8 by 10 feet chain-link fencing is also located northeast of the test stand. Test Stand 11 was historically used as a rocket motor test stand.

##### **Previous Investigations Summary**

A total of three surface and subsurface soil samples (SB70, SB73, and SB90) (see Figure 1-2) were collected by CRA and analyzed for VOCs, SVOCs, energetics, metals, pH, TS, and TOC (CRA 2010). PAHs and metals (benz[a]pyrene, benzo[b]fluoranthene, dibenzo[a,h]anthracene, indeno[1,2,3-cd]pyrene, manganese, and mercury) were detected at concentrations that exceeded their respective action levels. Benzo(a)pyrene, manganese, and mercury had the highest concentrations from each of the three samples, respectively, at 1,400 µg/kg, 714J mg/kg, and 0.26 mg/kg, which is more than twice the NJDEP Impact to Groundwater Soil Remediation action level at 200 µg/kg for benzo(a)pyrene, 42 mg/kg for manganese, and 0.1 mg/kg for mercury (CRA 2010). Results are included in the Summary of Previous Sampling Results sheets in Appendix C.

##### **Data Gaps**

This former test stand had three soil samples collected around it but no samples were collected from the ground between the three test stand bays. Recommend collecting two concrete chip samples (0 to 1 inch) from the walls/roof for disposal purposes and for use in the FFS. E & E also recommends collecting three surface soil samples from the ground between the three test stand bays if there is soil present, or concrete chip samples if concrete is in this area. In addition, one soil sample should be collected at the shed. This sample will also be used for general characterization purposes and for use in the FFS.

#### **3.2.4 Test Stand 37 (S-37)**

Test Stand 37 is an unoccupied concrete and steel structure (approximately 45 by 40 feet) with three test bays. It was historically used for solid motor mixing and casting.

##### **Previous Investigations Summary**

A total of four surface and subsurface soil samples (SB65, SB74 through SB76) (see Figure 1-2) were collected by CRA and analyzed for VOCs, SVOCs, energetics, metals, pH, TS, and TOC (CRA 2010). Three metals (cadmium, lead, and mercury) were detected at concentrations that exceeded their respective action levels in sample SB65. Lead had the highest concentration at 162 mg/kg, which is more than twice the NJDEP Impact to Groundwater Soil Remediation action level at 59 mg/kg (CRA 2010). The results are included in the Summary of Previous Sampling Results sheets in Appendix C.

### **3 Relevant Previous Investigations Summary and FFS Data Gaps**

#### **Data Gaps**

This former test stand had four soil samples collected around it but no samples were collected outside between the three test stand bays. E & E recommends collecting two concrete chip samples (0 to 1 inch) from the walls/roof for disposal purposes and for use in the FFS, and two surface soil samples for general characterization purposes and for use in the FFS.

#### **3.2.5 Propane Storage Area**

The Propane Storage Area is an unoccupied chain-link fenced area (22 feet by 31.5 feet) with piping and a concrete slab over the entire area. It was historically used as a propane storage area. All propane tanks have been removed.

#### **Previous Investigations Summary**

The propane storage area did not have samples collected during previous investigations.

#### **Data Gaps**

This former propane storage area currently only contains a chain-link fence, piping, and concrete foundations. Based on previous/current use there should be no source for spills, and due to the absence of staining, no additional sampling is recommended.

#### **3.2.6 No. 1 Sewage Treatment Plant**

The No. 1 Sewage Treatment Plant is an unused separator chamber and effluent tank (approximately 37 by 15 feet).

#### **Previous Investigations Summary**

A surface soil sample was collected from SB59, side gradient, (see Figure 1-2) by CRA and analyzed for VOCs, SVOCs, energetics, metals, pH, and TS (CRA 2010). Three metals (cadmium, lead, and mercury) were detected at concentrations that exceeded their respective action levels. Mercury was detected at a concentration of 7.4 mg/kg, which is more than 70 times the NJDEP Impact to Groundwater Soil Remediation action level at 0.1 mg/kg (CRA 2010). Results are included in the Summary of Previous Sampling Results sheets in Appendix C.

#### **Data Gaps**

The former No. 1 Sewage Treatment Plant currently contains a separator chamber and an effluent tank. Only one soil sample was previously collected side gradient to the treatment plant. E & E recommends collecting a water and sludge sample from the treatment plant and an immediately downgradient surface soil sample. These samples will be collected for general characterization purposes and for use in the FFS.

#### **3.2.7 S-48**

S-48 is a bare concrete pad (approximate 30 by 40 feet). It was historically used for equipment storage, lawnmower repair/salvage shop, and a private automotive repair garage. The building was removed sometime after 2005.

### **3 Relevant Previous Investigations Summary and FFS Data Gaps**

#### **Previous Investigations Summary**

A total of five samples (315-19 through 315-23) were collected by Lockheed Martin for PACM consisting of tiles, mastic, ceiling tiles, window glaze, and pipe insulation (Lockheed Martin Technology Services/Environmental Services REAC 2005). Three of the five samples contained chrysotile (5% to 40%), and the remaining two samples did not contain asbestos. These results are included in the Summary of Previous Sampling Results sheets in Appendix C.

Two paint chip samples (S-48 Wall and S-48 Bay Door) were collected by Lockheed Martin and analyzed for lead. Both samples contained lead at concentrations of 210 mg/kg and 24,000 mg/kg, respectively. One surface soil sample (UP-5) was collected by Lockheed Martin beneath the transformer and analyzed for PCBs (Lockheed Martin Technology Services/Environmental Services REAC 2005). The samples contained concentrations of Aroclor 1254 at 300 µg/kg. These results are included in the Summary of Previous Sampling Results sheets in Appendix C.

Two surface/subsurface soil samples (SB60 and SB61) were collected by CRA and analyzed for VOCs, SVOCs, energetics, metals, pH, TOC, and TS (CRA 2010). Cadmium had a concentration of 4.6 mg/kg in SB60 (subsurface sample) which is more than four times the NJDEP Impact to Groundwater Soil Remediation action level at 1 mg/kg (CRA 2010). Results are included in the Summary of Previous Sampling Results sheets in Appendix C.

#### **Data Gaps**

Collect two concrete chip samples from the concrete pad for use in the FFS and for disposal purposes.

#### **3.2.8 T-50**

T-50 is a bare concrete pad approximately 15 by 30 feet. The historic use is unknown.

#### **Previous Investigations Summary**

No samples were collected in the vicinity of T-50 during previous investigations.

#### **Data Gaps**

E & E recommends collecting two concrete chip samples from the concrete pad for use in the FFS.

#### **3.2.9 S-49**

S-49 is currently a pile of debris. It contains concrete/cinderblock remains for the exhaust tank and potentially underground cisterns. It was historically used as an exhaust tank with underground cisterns.

### **3 Relevant Previous Investigations Summary and FFS Data Gaps**

#### **Previous Investigations Summary**

One surface soil sample (SB72) was collected from the low-lying area adjacent to and downgradient from S-49, however, results for this sample were not found in the CRA 2010 report.

#### **Data Gaps**

Recommend collecting two samples from the debris pile for use in the FFS and to determine how to dispose of the debris. Also recommend collecting one water sample and one sediment sample from the cistern, if accessible, for general characterization purposes and for use in the FFS.

### **3.3 East Stand Area**

The East Stand Area consists of the 17 buildings/structures listed in Table 3-1. Of these 17 buildings/structures, 13 of them have had both indoor and/or outdoor samples that were previously collected from these buildings/structures. The previous investigation summaries, data gaps and E & E's recommendations to satisfy them are summarized below.

#### **3.3.1 Test Stand 2 (R-2)**

Test Stand 2 (R-2) is a large (approximately 50 by 75 feet) concrete and steel structure, approximately 30 feet high on the southwest side, with one rocket motor test bay. The test stand contains corrugated galvanized pipes (approximately 3-foot diameter) on each side going through the concrete structure. It was historically used as a large-sized rocket motor test stand.

#### **Previous Investigations Summary**

A subsurface soil sample (SB80B) (see Figure 1-2) was collected by CRA and analyzed for VOCs, metals, TS, and energetics (CRA 2010). No concentrations exceeded their respective action levels. Two surface soil samples (SB80A and SB84A) (see Figure 1-2) were collected by CRA and analyzed for VOCs, metals, pH, TS, and TOC (CRA 2010). SB84A had detected metals (cadmium, lead, mercury, and silver) above their respective action levels. Cadmium had a concentration of 3.8J mg/kg, which is more than three times the NJDEP Impact to Groundwater Soil Remediation action level at 1 mg/kg (CRA 2010). Mercury had a concentration of 0.25 mg/kg, which is more than two times the NJDEP Impact to Groundwater Soil Remediation action level at 0.1 mg/kg (CRA 2010). Results are included in the Summary of Previous Sampling Results sheets in Appendix C.

#### **Data Gaps**

Recommend collecting; one concrete chip sample from the wall beneath rocket motor mounts, one concrete chip or surface soil sample from the floor beneath the rocket motor mounts, and one surface soil sample at the center of the southern edge of the structure (rocket motor exhaust exit location) due no previous samples being collected from these areas of the test stand. These samples will be used for general characterization purposes and for use in the FFS.

### **3 Relevant Previous Investigations Summary and FFS Data Gaps**

#### **3.3.2 R-33**

R-33 is a small (approximately 9 by 12 feet), insulated galvanized sheet metal building with steel framing, utilities, and an air vent built into the roof. A 3 by 8-foot concrete pad, possibly used for an AST, is located adjacent to R-33. This building had evidence of a recent fire inside. There is no historical use description available from previous reports.

##### **Previous Investigations Summary**

One surface soil sample (SB91A) (see Figure 1-2) was collected approximately 40 feet southwest of R-33 by CRA and analyzed for VOCs, metals, pH, TS, and TOC (CRA 2010). The sample contained concentrations of lead (134 mg/kg) and mercury (0.15 mg/kg) above their respective action levels. The lead concentration was more than two times the NJDEP Impact to Groundwater Soil Remediation action level at 59 mg/kg (CRA 2010). Results are included in the Summary of Previous Sampling Results sheets in Appendix C.

##### **Data Gaps**

Recommend collecting one soil sample at the entrance of the building and one concrete chip sample from the floor. These samples will be used for general characterization purposes and for use in the FFS.

#### **3.3.3 R-29**

R-29 is a storage building (approximately 20 by 40 feet) with galvanized sheet metal, steel framing, and utilities which contains paper debris and 5.5-inch floppy disks. It was historically used for miscellaneous storage/document storage.

##### **Previous Investigations Summary**

Two samples, one soil (UP-7S) and one transformer oil (UP-7B) (see Figure 1-2), were collected approximately 75 feet south of R-29 by Lockheed Martin and analyzed for PCBs (Lockheed Martin SERAS 2010). No PCBs were detected in the soil sample; however, the transformer oil sample contained PCB Aroclor-1260 at 120,000 µg/kg, which is more than twice the action level at 50,000 µg/kg (Lockheed Martin SERAS 2010). Sample results are included in the Summary of Previous Sampling Results sheets in Appendix C.

##### **Data Gaps**

No sampling has been performed in or adjacent to this building, which was used for miscellaneous storage/document storage. E & E recommends collecting a composite surface soil sample from the perimeter of the building for general characterization purposes and a concrete chip sample from the floor for disposal purposes and for use in the FFS.

#### **3.3.4 R-21**

R-21 is a concrete block building (approximately 60 feet by 70 feet), which was built into the hillside on the north and east sides. R-21 contains miscellaneous debris including approximately 30 drums/containers (55-, 30- and 5-gallon) in a room at the southern corner of the building. Elevated photoionization detector



### **3 Relevant Previous Investigations Summary and FFS Data Gaps**

readings (5 ppm) in ambient air were measured at the entrance to the room containing the drums. A concrete AST saddle is located on south side of building, although the AST has been removed. R-21 was historically used as an instrument center/boiler house/sewage treatment control center.

#### **Previous Investigations Summary**

Two paint chip samples (R-21 Wall and R-21 Door) were collected by Lockheed Martin from this building and analyzed for lead (Lockheed Martin Technology Services/Environmental Services REAC 2005). The paint chip samples contained lead at concentrations of 1,900 mg/kg and 5,500 mg/kg, respectively. Sample results are included in the Summary of Previous Sampling Results sheets in Appendix C.

A total of 18 samples (315-30 through 315-47) were collected by Lockheed Martin for PACM consisting of tiles, mastic, ceiling tiles, window glaze, and pipe insulation (Lockheed Martin Technology Services/Environmental Services REAC 2005). Ten of the 18 samples contained chrysotile (2% to 16%), and the remaining eight samples did not contain asbestos. Sample results are included in the Summary of Previous Sampling Results sheets in Appendix C.

One soil sample (UP-7) (see Figure 1-2) was collected by Lockheed Martin below a utility pole (approximately 110 feet west) containing a transformer and was analyzed for PCBs (Lockheed Martin Technology Services/Environmental Services REAC 2005). No PCBs were detected. A surface soil sample (SB87A) (see Figure 1-2) was collected by CRA and analyzed for VOCs, metals, pH, TS, and TOC (CRA 2010). Lead and mercury were detected slightly above their respective action levels. Sample results are included in the Summary of Previous Sampling Results sheets in Appendix C.

#### **Data Gaps**

This building contains approximately 30 drums/containers (55-, 30-, and 5-gallon), and other debris. E & E recommends hazard categorization and proper disposal of the drums/containers. In addition, collection of one concrete chip sample from the drum room and one composite surface soil sample from around the building for general characterization and disposal purposes, and for use in the FFS.

#### **3.3.5 Pump House 3 (P-3)**

Pump House 3 (P-3) is an unoccupied shed (8 feet by 8 feet) containing piping, electrical, and two water tanks (60 gallons each). The shed is constructed of 2 feet by 4 feet fiberboard panels with a corrugated metal outer surface. It was historically used as a water pump house.

#### **Previous Investigations Summary**

No samples were collected in the vicinity of Pump House 3 (P-3) during previous investigations.

### **3 Relevant Previous Investigations Summary and FFS Data Gaps**

#### **Data Gaps**

Based on the previous/current use and site walkover observations, no additional sampling is recommended.

#### **3.3.6 Test Stand 3 (R-3)**

Test Stand 3 (R-3) contains one concrete test bay. It was historically used as a rocket motor test stand with exhaust scrubber/effluent treatment. Two abandoned ASTs were observed lying on the ground on the north side of the structure.

#### **Previous Investigations Summary**

A total of two samples (315-48 and 315-49) were collected by Lockheed Martin for PACM consisting of pipe insulation and wrapping (Lockheed Martin Technology Services/Environmental Services REAC 2005). Both samples contained chrysotile (40% and 10%). One sample (R-3 Wall) of a crystalline crust was collected by Lockheed Martin and analyzed for energetics (Lockheed Martin SERAS 2010). No concentrations were detected exceeding their respective action levels. Sample results are included in the Summary of Previous Sampling Results sheets in Appendix C.

Three subsurface soil samples (SB77B, SB78B, and SB79B) (see Figure 1-2) were collected by CRA and analyzed for VOCs, metals, TS, and energetics (CRA 2010). None of the samples contained concentrations exceeding their respective action levels. Surface soil samples (SB77A, SB78A, and SB79A) (see Figure 1-2) were also collected by CRA and analyzed for VOCs, metals, pH, TS, and TOC (CRA 2010). One sample (SB77A) had a concentration exceeding the respective action level for manganese at 687 mg/kg which is more than 16 times the NJDEP Impact to Groundwater Soil Remediation action level at 42 mg/kg (CRA 2010). Sample results are included in the Summary of Previous Sampling Results sheets in Appendix C.

#### **Data Gaps**

Recommend collecting surface soil samples near the ASTs unless additional information is obtained indicating that the ASTs were properly decommissioned. E & E also recommends collecting one surface soil sample from the floor of the test bay for general characterization purposes and for use in the FFS, and two concrete chip samples from the walls and floor of the test bay for disposal purposes and for use in the FFS.

#### **3.3.7 Pump House 4 (P-4)**

Pump House 4 (P-4) is an unoccupied shed (10 feet by 12 feet) consisting of galvanized sheet metal with steel framing and utilities. No pump was observed during the site walkover. It was historically used as a water pump house.

#### **Previous Investigations Summary**

One soil sample (UP-6) (see Figure 1-2) was collected by Lockheed Martin below a utility pole, located approximately 50 feet to the west, containing a transformer and was analyzed for PCBs (Lockheed Martin Technology



### **3 Relevant Previous Investigations Summary and FFS Data Gaps**

Services/Environmental Services REAC 2005). No PCBs were detected. Sample results are included in the Summary of Previous Sampling Results sheets in Appendix C.

#### **Data Gaps**

Based on previous/current use, there should be no source for spills. Due to the absence of staining, no additional sampling is recommended by E & E.

#### **3.3.8 R-51 (includes T-51)**

R-51 is a metal building which is empty except for office space remains, and piping from the fuel oil AST to the south. The fuel oil AST is 12-foot diameter, 16-foot-tall and surrounded by an earthen berm, adjacent to R-51. R-51 was historically used as a boiler house for R-4 activities, and includes the associated fuel oil AST (T-51).

#### **Previous Investigations Summary**

Four samples (315-50 through 315-53) were collected by Lockheed Martin for PACM consisting of TSI pipe insulation, tar around pipe, and TSI pipe air cell (Lockheed Martin Technology Services/Environmental Services REAC 2005). Two of the four samples contained chrysotile (4% to 45%), one sample contained Amosite (25%), and the remaining sample did not contain asbestos. Sample results are included in the Summary of Previous Sampling Results sheets in Appendix C.

Two asbestos wipe samples (R-51 Work Bench and R-51 Tank) were collected by Lockheed Martin and analyzed using American Society for Testing and Materials D6480-99 (Lockheed Martin Technology Services/Environmental Services REAC 2005). No asbestos was detected. Sample results are included in the Summary of Previous Sampling Results sheets in Appendix C.

One sludge sample was collected from inside the AST (T-51) by CRA and analyzed for VOCs, metals, energetics, and pH (CRA 2010). The following VOCs were detected above their respective action levels; 1,4-dichlorobenzene (170J µg/kg), ethylbenzene (210J µg/kg), isopropylbenzene (990J µg/kg), styrene (740J µg/kg), and xylene (2,600J µg/kg). Several metals were detected above their action levels including; arsenic (5.3 mg/kg), chromium (19.8 mg/kg), copper (22 mg/kg), and lead (160 mg/kg). No energetics were detected. Sample results are included in the Summary of Previous Sampling Results sheets in Appendix C.

One surface soil sample (SB88A) (see Figure 1-2) was collected adjacent to AST T-51 by CRA and analyzed for VOCs, metals, pH, TS, and TOC (CRA 2010). No detections were noted. Sample results are included in the Summary of Previous Sampling Results sheets in Appendix C.

### **3 Relevant Previous Investigations Summary and FFS Data Gaps**

#### **Data Gaps**

Recommend collecting two concrete chip samples (0 to 1 inch deep) from the floor of R-51 and two composite surface soil samples from around the building for disposal purposes and for use in the FFS.

#### **3.3.9 Test Stand 4 (R-4)**

Test Stand 4 (R-4) is a large building with galvanized sheet metal steel, framing, and utilities. Test Stand 4 (R-4) was used for testing of developmental engines which used mixed hydrazine and nitrogen tetroxide. Remnants of instrumentation, one large rocket motor test room, four moderately sized test rooms with drainage troughs discharging outside the building, and two small laboratories were observed during the site walkover. In addition, a 5-gallon bucket half full of what appeared to be waste oil is located in one of the small laboratories. R-4 was historically used as a rocket motor test stand with altitude test chambers.

#### **Previous Investigations Summary**

Two paint chip samples (R-4 Vent and R-4 Wall) were collected by Lockheed Martin and analyzed for lead (Lockheed Martin Technology Services/Environmental Services REAC 2005). The samples contained lead at concentrations of 120 mg/kg and 6,000 mg/kg, respectively. Sample results are included in the Summary of Previous Sampling Results sheets in Appendix C.

A total of three samples (315-16 through 315-18) were collected by Lockheed Martin for PACM consisting of thermal systems insulation (TSI) in the furnace, thermal brick, and TSI outside the furnace surface (Lockheed Martin Technology Services/Environmental Services REAC 2005). Two of the samples (315-16 and 315-18) contained chrysotile (10% and 15%) and sample 315-17 did not contain asbestos. Sample results are included in the Summary of Previous Sampling Results sheets in Appendix C.

Three subsurface soil samples (SB81B, SB82B, and SB83B) (see Figure 1-2) were collected by CRA and analyzed for metals, TS, and energetics (CRA 2010). None of the samples contained concentrations exceeding their respective action levels. Three surface soil samples (SB81A, SB82A, and SB83A) (see Figure 1-2) were collected by CRA and analyzed for VOCs, metals, pH, TS, and TOC (CRA 2010). Mercury (0.21 mg/kg) was detected in sample SB82A above its respective action level which is more than two times the NJDEP Impact to Groundwater Soil Remediation action level at 0.1 mg/kg (CRA 2010). Sample results are included in the Summary of Previous Sampling Results sheets in Appendix C.

#### **Data Gaps**

The following sampling is recommended:

- Collect one concrete chip sample from the floor from each of the two small laboratories for disposal purposes and for use in the FFS.

### **3 Relevant Previous Investigations Summary and FFS Data Gaps**

- Collect two concrete chip samples from the floor of the main (large) rocket motor test room for disposal purposes.
- Collect four concrete chip samples from the troughs located in the four moderately sized test rooms. These samples will be used for general characterization purposes, used in the FFS, and for disposal purposes.
- Collect four soil samples immediately adjacent to the building at the discharge points of each of the troughs. These samples will be used for general characterization purposes, used in the FFS, and for disposal purposes.
- Sample the oil contained in a 5-gallon bucket located in one of the small laboratories for disposal purposes.

#### **3.3.10 Cistern/Cistern Pump**

The Cistern/Cistern Pump consists of two, 6-foot diameter concrete lids on buried vaults adjacent to a 4-foot by 6-foot concrete slab. These vaults were observed to be filled with water during the site walkover. The historical use of these structures is unknown.

#### **Previous Investigations Summary**

The cistern/cistern pump did not have any samples collected during previous investigations.

#### **Data Gaps**

Based on the site walkover observations and review of previous investigation reports, it was determined that the structure previously identified as the cistern/cistern pump was actually the No. 2 Sewage Treatment Plant, which was previously sampled. The cistern/cistern pump found during the site walkover has not been sampled during previous investigations. Therefore, E & E recommends collecting a sludge and/or water sample from inside both the cistern and cistern pump areas (unless they are connected as one unit, then only one sample would be recommended) for general characterization purposes and for use in the FFS.

#### **3.3.11 No. 2 Sewage Treatment Plant**

The No. 2 Sewage Treatment Plant consists of a separator chamber and effluent tank, which was historically used for sewage treatment.

#### **Previous Investigations Summary**

The No. 2 sewage treatment plant had water samples (misabeled as Cistern, and Cistern/Pump) (see Figure 1-2) collected by Lockheed Martin and analyzed for TAL metals; pesticides; PCBs; base, neutrals, and acid extractables (BNAs); VOCs; and perchlorate (Lockheed Martin Technology Services/Environmental Services REAC 2005). The following metals were detected above their respective action levels: barium, calcium, copper, iron, magnesium, manganese, potassium, and zinc.

### **3 Relevant Previous Investigations Summary and FFS Data Gaps**

The No. 2 sewage treatment plant had a sludge sample (misabeled as Cistern/Pump) collected by Lockheed Martin and analyzed for TAL metals, pesticides, PCBs, BNAs, VOCs, and perchlorate (Lockheed Martin Technology Services/Environmental Services REAC 2005). The sludge sample had numerous metals, BNAs, VOCs, and pesticides detected above their respective action levels.

One paint chip sample was collected from the No. 2 sewage treatment plant (misabeled as Cistern/Pump) and analyzed for lead. Lead was detected at 280 mg/kg.

One subsurface soil sample (SB79) was collected by CRA to provide information on potential impacts to the soil due to the operation of the former sewage treatment plant (CRA 2010). The sample was analyzed for energetics, metals, VOCs, TS, pH, and TOC. No concentrations exceeded their respective action levels.

#### **Data Gaps**

The water and sludge from the separator chamber and effluent tank were previously sampled as well as a downgradient soil sample. Based on previous/current use and previous sample results, no additional sampling is recommended.

#### **3.3.12 Scrubber**

Only a bare concrete foundation of this structure remains. The scrubber collected material from rocket tests performed at Test Stand (R-3). The material would have passed through the scrubber, into what appears to be a settling basin with an overflow that ultimately discharged to the west through an opening. It was historically used as a scrubber building designed to clean exhaust gases from test firings of rocket motors.

#### **Previous Investigations Summary**

Three subsurface soil samples (SB77B, SB78B, and SB89B) (see Figure 1-2) were collected by CRA to obtain information on potential impacts to soil due to the operation of Test Stand R-3 and the associated Scrubber building (CRA 2010). The samples were analyzed for VOCs, metals, energetics, and TS. None of the samples contained concentrations exceeding their respective action levels. Sample results are included in the Summary of Previous Sampling Results sheets in Appendix C.

Two surface soil samples (SB78A and SB89A) (see Figure 1-2) were also collected by CRA and analyzed for VOCs, metals, pH, TOC, and TS (CRA 2010). Sample SB89A contained a concentration exceeding the respective action level for lead (119J mg/kg) which is more than two times the NJDEP Impact to Groundwater Soil Remediation action level at 59 mg/kg (CRA 2010). Sample results are included in the Summary of Previous Sampling Results sheets in Appendix C.

### **3 Relevant Previous Investigations Summary and FFS Data Gaps**

#### **Data Gaps**

Recommend collecting two concrete chip samples for disposal purposes and for use in the FFS.

#### **3.3.13 Water Cooling Tower**

The Water Cooling Tower is a wooden structure with two large fans on the roof and a concrete foundation. The structure was historically used as a water cooling tower; however, the source of the water which required cooling is unknown.

#### **Previous Investigations Summary**

Two subsurface soil samples (SB85 and SB86) (see Figure 1-2) were collected by CRA to obtain information on potential impacts from runoff and/or discharges into the low lying marshy area immediately downgradient of the cooling tower (CRA 2010). The samples were analyzed for energetics, metals, and TS. Neither of the samples contained concentrations exceeding their respective action levels. Sample results are included in the Summary of Previous Sampling Results sheets in Appendix C.

#### **Data Gaps**

Recommend collecting two composite soil samples from immediately adjacent to the cooling tower and one concrete chip sample from the building floor for general characterization purposes, use in the FFS, and disposal purposes.

#### **3.3.14 Condenser and Hot Well**

The Condenser and Hot Well consists of a concrete settling basin with one large chamber that allowed fluids to overflow into a second smaller chamber, which has an opening that allowed discharge to the surface. The condenser and hot well received fluids from Test Stand 4 (R-4), which were carried in aboveground piping (removed) to the structure.

#### **Previous Investigations Summary**

Three subsurface soil samples (SB81B through SB83B) (see Figure 1-2) were collected by CRA (south of the Condenser and Hot Well) (CRA 2010). The samples were analyzed for metals, energetics, and TS. None of the samples contained concentrations exceeding their respective action levels. Sample results are included in the Summary of Previous Sampling Results sheets in Appendix C.

Three surface soil samples (SB81A through SB83A) (see Figure 1-2) were also collected by CRA and analyzed for VOCs, metals, pH, TOC, and TS (CRA 2010). Only sample SB82A contained mercury at a concentration of 0.21 mg/kg, which is more than two times the NJDEP Impact to Groundwater Soil Remediation action level at 0.1 mg/kg (CRA 2010). Sample results are included in the Summary of Previous Sampling Results sheets in Appendix C.

#### **Data Gaps**

Recommend collecting one surface soil sample (0 to 6 inches deep) from the soil in the larger (settling) chamber for general characterization purposes and one

### **3 Relevant Previous Investigations Summary and FFS Data Gaps**

concrete chip sample (0 to 1 inch deep) for disposal purposes and for use in the FFS.

#### **3.3.15 Transformer Bank**

All that remains of the Transformer Bank is a chain-link fence approximately 25 feet by 15 feet (three sides). Power poles are located adjacent to the fenced area and one power pole is also located inside fenced area. No concrete pads or transformer support structures were observed within the fenced area during the site walkover.

#### **Previous Investigations Summary**

The transformer bank area did not have samples collected during previous investigations.

#### **Data Gaps**

Recommend collecting two surface soil samples (0 to 6 inches deep) from inside the fence area for general characterization purposes and for use in the FFS.

#### **3.3.16 Agitator and Effluent Treatment Basin**

The Agitator and Effluent Treatment Basin includes a small building (10 by 10 feet) with a lower basin (22 by 30 feet). The lower basin is surrounded by 3-foot concrete wall with a concrete overflow that discharges to the east.

#### **Previous Investigations Summary**

One sediment sample (SD57) (see Figure 1-2) was collected by CRA northeast (approximately 25 feet, side gradient) of the Agitator/Effluent Treatment Basin (CRA 2010). The sample was analyzed for metals, TS, pH, and grain size. The sample contained copper at a concentration of 38.9 mg/kg which is more than two times the New Jersey freshwater ecological screening standard at 16 mg/kg (CRA 2010). Sample results are included in the Summary of Previous Sampling Results sheets in Appendix C.

#### **Data Gaps**

Recommend collecting two soil samples (0 to 6 inches deep) from inside the settling basin for general characterization purposes and for use in the FFS.

#### **3.3.17 Waste Disposal Area**

The Waste Disposal Area is located approximately 150 feet east of R-47. The area is situated in the woods and contains miscellaneous debris including an empty rusted 55-gallon drum, metal debris, and metal piping.

#### **Previous Investigations Summary**

The waste disposal area did not have samples collected during previous investigations.

### 3 Relevant Previous Investigations Summary and FFS Data Gaps

#### Data Gaps

Recommend collecting two surface soil samples from the waste disposal area for general characterization purposes and for use in the FFS.

#### 3.4 Drum Removal

During the site visit conducted by E & E on October 25 and 26, 2012 (see the photo log in Appendix D), drums were observed at various structures/buildings. Table 3-2 lists buildings/structures with associated drums that are recommended to be sampled, categorized, and properly disposed of.

**Table 3-2 List of Drums Recommended for Removal in OU3, Radiation Technology Superfund Site, Rockaway Township, New Jersey**

Building/ Structure Name	Comment
<b>P2 Area</b>	
R-47	Three drums containing petroleum products and a fourth containing an unknown liquid. All had elevated PID readings (ranging from 15 ppm to 90 ppm) above background (0 ppm).
R-43	One, 30-gallon drum possibly containing grease.
<b>East Stand Area</b>	
R-21	Approximately 30 drums/containers (55-, 30-, and 5-gallon) are located in a room at the southern corner of the building. Elevated photoionization detector readings (5 ppm) in ambient air were measured at the entrance to the room containing the drums.
Test Stand 4 (R-4)	One, 5-gallon bucket approximately half full of oily liquid.

#### 3.5 Tank Removal

Abandoned storage tanks were observed during the site visit on October 25 and 26, 2012. The tanks were located at various structures/buildings and many had been removed from their previous locations and placed on the ground. E & E recommends the tanks be sampled, categorized, and properly disposed of off-site (see the photo log in Appendix D; see Table 3-3).

**Table 3-3 List of Tanks Recommended for Removal in OU3, Radiation Technology Superfund Site, Rockaway Township, New Jersey**

Building/ Structure Name	Comment
<b>P2 Area</b>	
R-47	Fuel storage tank AST on west side (also observed what appears to be a boiler system expansion tank and possible UST - observed a vent pipe sticking out of the ground).
<b>South Stand Area</b>	
S-46	Observed an empty tank on side of the road.
<b>East Stand Area</b>	
Test Stand 3 (R-3)	Two ASTs on north side.
Old Water Tower	Empty former fuel oil AST (4-foot diameter and 10 feet long) on east side.
T-51	Former fuel oil AST (12-foot diameter, 16-foot tall), sludge sampled previously.



# 4

## Conclusions and Recommendations

After E & E's review of existing data and site walkover, E & E believes additional data is needed to complete a FFS with reasonably accurate cost estimates. A general summary of our recommendations is provided below.

- Additional surface soil data is needed around many buildings/structures to support FFS estimates for material handling and health and safety requirements. Very few samples have been collected adjacent to buildings (within about 5 feet);
- Additional asbestos and lead based paint data is needed to support FFS estimates. Many of the structures that remain at the site have suspect materials which had not been previously sampled for asbestos and lead based paint; and
- Chip samples from concrete are needed to support FFS estimates for concrete decontamination and potential for recycling.

Moving forward, we also need to define EPA's criteria/constraints associated with OU3 as these will impact what, if any, additional data gathering is done and the overall accuracy and reliability of FFS cost estimates. These include:

- Criteria for buildings to remain in place after remediation (e.g., asbestos and lead based paint remediated, surfaces sampled and decontaminated, structural analysis);
- Whether building/structure slabs should remain in place if a building is demolished; and
- Limits of OU3 around buildings/structures (is this limited to approximately 5 feet of surface soil before becoming part of the soils OU?).

### **P2 Area**

The P2 Area contains eight buildings/structures, of which, seven have previously had samples collected in the vicinity. Additional sampling is recommended at R-47, R-43, R-34, and the Acid Oxidizer Storage Tank area for general

## 4 Conclusions and Recommendations

characterization purposes, use in preparing the FFS, and for disposal purposes. Table 4-1 provides a summary the samples recommended.

### South Stand Area

Nine buildings/structures are located in the South Stand Area. Test Stand 12, S-46, Test Stand 11, Test Stand 37, No. 1 Sewage Treatment Plant, and S-48 have previously had samples collected in the area. Additional sampling is recommended at these locations as well as at S-49 and T-50. Collection of these samples is proposed for general characterization purposes, preparation of the FFS, and for disposal purposes.

### East Stand Area

Seventeen buildings/structures are located in the East Stand Area, of which, 13 have previously had samples collected in the vicinity. Additional sampling is recommended at Test Stand 2, R-33, R-29, R-21, Test Stand 3, R-51, R-4, Cistern/Cistern Pump, Scrubber, Water Cooling Tower, Condenser and Hot Well, Transformer Bank, Agitator and Effluent Treatment Basin, and Waste Disposal Area. Collection of these samples is proposed for general characterization purposes, preparation of the FFS, and for disposal purposes.

**Table 4-1 Summary of Additional Samples Recommended in OU3, Radiation Technology Superfund Site, Rockaway Township, New Jersey**

OU3 Buildings/Structures	Surface Soil Sample	Concrete Chip Sample	Tank/Cistern Contents Sample
<b>P2 Area</b>			
R-47	1	3	1
Paint Locker	0	0	0
Fuel Storage Area	0	0	0
Ignitor Storage	0	0	0
Acid (Oxidizer) Storage Tank	1	0	0
Pump House 2 (P-2)	0	0	0
R-43	1	0	0
R-34	0	2	0
<b>P2 Area Sample Total</b>	<b>3</b>	<b>5</b>	<b>1</b>
<b>South Stand Area</b>			
Test Stand 12	2	2	0
S-46	1	2	1
Test Stand 11	4	2	0
Test Stand 37	0	2	0
Propane Storage Area	0	0	0
No. 1 Sewage Treatment Plant	1	0	2
S-48	0	2	0
T-50	0	2	0
S-49	2	0	2
<b>South Stand Area Sample Total</b>	<b>10</b>	<b>12</b>	<b>5</b>

## 4 Conclusions and Recommendations

**Table 4-1 Summary of Additional Samples Recommended in OU3, Radiation Technology Superfund Site, Rockaway Township, New Jersey**

OU3 Buildings/Structures	Surface Soil Sample	Concrete Chip Sample	Tank/Cistern Contents Sample
<b>East Stand Area</b>			
Test Stand 2 (R-2)	1	2	0
R-33	1	1	0
R-29	1	1	0
R-21	1	1	0
Pump House 3 (P-3)	0	0	0
Test Stand 3 (R-3)	2	2	0
Pump House 4 (P-4)	0	0	0
R-51 (Includes T-51)	2	2	0
Test Stand 4 (R-4)	4	8	0
Cistern/Cistern Pump	0	0	2
No. 2 Sewage Treatment Plant	0	0	0
Scrubber	0	2	0
Water Cooling Tower	2	1	0
Condenser and Hot Well	1	1	0
Transformer Bank	2	0	0
Agitator and Effluent Treatment Basin	2	0	0
Waste Disposal Area	2	0	0
<b>East Stand Area Sample Total</b>	<b>21</b>	<b>21</b>	<b>2</b>
<b>Sample Total for OU3 which includes: P2 Area, South Stand Area, and East Stand Area</b>	<b>34</b>	<b>38</b>	<b>8</b>

### Cultural Significance Study

Hartgen Archaeological Associates Inc., participated on the site walkover and reviewed existing site information to evaluate if such information is sufficient to evaluate the cultural significance of the buildings prior to sampling, or whether additional investigations (i.e., record searches) would be necessary. The site walkover was conducted to collect information pertaining to each standing structure or building, and to evaluate, to the degree possible, its condition and state of preservation.

The condition of the buildings and structures at the Radiation Technology OU3 Superfund Site range from poor to good. In addition to information collected during the site visit, a cultural resource reconnaissance survey (CRCG 2007) and a Web site established by a former employee (Holland 2012) were reviewed for material useful in determining the cultural significance of the site or any of its component features.

The information available at present is insufficient to determine the eligibility of the built resources on the site for inclusion on the National Register according to

## 4 **Conclusions and Recommendations**

the significance criteria. There are significant gaps in information remaining which will be pertinent to making a determination. Information gaps include:

- The dates of construction for each structure are poorly understood at present. Because of the non-diagnostic nature of most of the building materials utilized in the construction of the buildings and structures on the site, additional historical research will be required to establish the dates of their construction more precisely. The aerial photography included in the cultural resource reconnaissance report on the property (CRCG 2007), is helpful to this end, but additional imagery is needed. This is important in order to establish which buildings and structures were extant during the period of significance.
- A more comprehensive sense of the extent of the built environment and associated landscape during the period of significance needs to be established. An understanding of how much of the campus survives from the significant period needs to be established in order to determine the degree to which the present conditions at the site represent and embody historical conditions. Similarly, the condition of each structure needs to be assessed against period visual documentation, if available, or oral history. The Web site resource (Holland 2012) includes only a few photographs that can be used in this way.
- The contexts for contemporary facilities, connected to either Cold War Era technological developments or to the space program, need to be reviewed in order to establish the degree to which the present site may be a representative example of such facilities.

Based on the historic information reviewed and the data gaps described above, additional study is recommended to evaluate if the buildings/structures have cultural significance and to prepare the history/prior building use study. Further, it is recommended that cultural significance be considered as the eligibility of the architectural resources for the National Register in accordance with National Register significance criteria (36 CFR Part 60).

The Hartgen Technical Evaluation Memo is included in Appendix A.

### **Asbestos and Lead-Based Paint Survey**

YU & Associates Incorporated completed a site walkover to confirm the presence and locations of previously tested PACM and lead based or lead containing paint, to identify potential materials not tested or otherwise accounted for in previous inspections, and to determine the level of personal protective equipment that would be required for inspection services and sampling.

YU inspectors identified suspect friable and non-friable asbestos-containing materials in most of the on-site structures that have not previously been sampled and analyzed. These additional suspect asbestos-containing materials need to be sampled and analyzed or presumed to be asbestos-containing material if inaccessible during any subsequent inspection. Tables 4-2, 4-3 and 4-4

## **4 Conclusions and Recommendations**

summarize the results of previously collected asbestos samples and recommendations for additional sampling for each building/structure.

Out of the total of 35 structures located on the site, only 7 were previously sampled for lead paint and many painted surfaces within these buildings were not investigated. Lead paint inspection was conducted by Lockheed Martin in 2005 by taking paint chip samples and analyzing them by the Atomic Absorption method. Of the 12 paint samples tested, 4 paints can be defined as lead-based paint (40 CFR Part 745, Subpart 223) with lead content of more than 0.5% : S-48 Bay Door (2.4%), R-4 Wall (0.6%), R-21 Door (0.55%), and R-43 Outer Door (8.9%). The rest of tested paints are defined as lead containing paints having greater than 0.06% but less 0.5% lead content. Results from Lockheed Martin's study are shown in Table 4-5.

YU estimated that there are approximately 60 suspect asbestos-containing materials, including about 25 friable materials, that need to be tested throughout all visited structures to complete the data gap in the hazardous material survey. A few suspect materials, including fire door insulation, boiler interior lining, and some gasket in flanges were not readily accessible for sampling (would require significant labor efforts). If these materials are not accessible for the full investigation, they would be assumed asbestos-containing material without sampling.

Most asbestos sampling can be performed in Level D PPE. When taking samples of friable asbestos containing materials, modified Level C PPE comprised of a half-face respirator and Tyvek suit would provide adequate protection.

Based on the observations made during the site walkover and existing analytical data summarized in Table 4-5, it is recommended that a Lead inspection and screening using XRF instruments be performed in all the on-site buildings to address the many untested structures and paint surfaces.

The YU Memorandum (includes a site walkover memorandum) is included in Appendix B.

**Table 4-2 By-Building Listing of previously Identified Asbestos Containing Materials and Suspect Materials proposed for Testing in South Stand**

Building	Materials Tested by J&S Environmental Laboratories	Testing Result (LM, 2005)	Wipe Sampling Results for Asbestos (LM, 2005)	Suspected ACM Proposed for Sampling
S-46 (in LM Report was mistakenly designated as S-48)	TSI Pipe insulation (North/West)	ACM: 35% Chrys.	on Refrigerator: 13,000 struct/cm2	2'x4' ceiling tiles
	TSI Fittings / Elbows (North/West)	ACM: 30% Chrys.	on Fork Lift: 35,000 struct/cm2	9"x9" floor tiles
	TSI pipe insulation (East side)	ACM: 40% Chrys.	on Lawn Mower: <4,000 struct/cm2	Sheetrock wall
	9"x9" Green floor tile w/ mastic (south/west sides)	ACM: 5% Chrys.		Pipe insulation throughout building
	associated mastic	ACM: 5% Chrys.		Presumed built-up roofing material
	12"x24" Ceiling tiles (South/west Side)	NAD		Mastic sampling for VAT and ceiling tiles
	Window glaze (North side)	NAD		
S-48 (demolished)	No Past Data Available			No Suspect Material Found
Test Stand 12	No Past Data Available			Pipe insulation throughout building
				Wall vapor barrier
				Door caulking
				Wire insulation
Test Stand 11	No Past Data Available			No Suspect Material Found
Test Stand 37	No Past Data Available			Caulking
				Tar
				Skim coat over walls
				Green floor tiles in debris
				Tar paper in debris
No. 1 Sewage Treatment Plant	No Past Data Available			Black mastic
				Light blue-green paint
				Black paint
				Gasket insulation at flanges
Propane Storage Area	No Past Data Available			No Suspect Material Found

Abbreviations:

LM - Lockheed Martin  
 ACM - Asbestos Containing Material  
 NAD - No asbestos detected

Chrys. - Chrysotile  
 Amos. - Amosite



**Table 4-3 By-Building Listing of Previously Identified Asbestos Containing Materials and Suspect Materials Proposed for Testing in P2 Area**

Building	Materials Tested by J&S Environmental Laboratories	Testing Result (LM, 2005)	Wipe Sampling Results for Asbestos (LM, 2005)	Suspected ACM Proposed for Sampling
Ignitor Storage	No Past Data Available			Cloth cushion Gasket cushioning Black paint on sheetrock
Fuel Storage Tank	No Past Data Available			No Suspect Material Found
Paint Locker	No Past Data Available			No Suspect Material Found
R-47	9"x9" Green floor tile w/ mastic (west side by door)	ACM: 12% Chrys.	on ATV: 28,000 struct/cm2	Pipe insulation (by West gate)
	associated mastic	ACM: 10% Chrys.	on Snowmobile: 16,000 struct/cm2	Tar paper outside by the west
	9"x9" Beige floor tile w/ mastic (west side by door)	ACM: 8% Chrys.		Sheetrock
	associated mastic	ACM: 4% Chrys.		Pipe insulation in West Room above ceiling tiles
	12"x24" Ceiling tiles (west side by door)	NAD		Boiler gasket insulation
	TSI Fittings / Elbows	ACM: 10% Chrys.		Firedoor insulation
P-2 (Pumphouse 2)	Transite pipe (outside 30' from door)	ACM: 25% Chrys.		Sheetrock Boiler/Tank insulation Cable insulation
R-43	No Past Data Available			No Suspect Material Found
R-34	9x9" Brown floor tile (west room)	ACM: 12% Chrys.		Sheetrock
	associated mastic	ACM: 5% Chrys.		Tar covering on metal roof
	9"x9" Brown floor tile (west room bathroom)	ACM: 10% Chrys.		Door insulation
	associated mastic	ACM: 4% Chrys.		Cable insulation
	Window glaze (west room window)	ACM: 4% Amos.		Debris Presumed built-up roofing material
Acid (Oxidizer) Storage Tank	No Past Data Available			No Suspect Material Found

Abbreviations:

LM - Lockheed Martin

ACM - Asbestos Containing Material

NAD - No asbestos detected

Chrys. - Chrysotile

Amos. - Amosite

**Table 4-4 By-Building Listing of Previously Identified Asbestos Containing Materials and Suspect Materials Proposed for Testing in East Stand**

Building	Materials Tested by J&S Environmental Laboratories	Testing Result (LM, 2005)	Wipe Sampling Results for Asbestos (LM, 2005)	Suspected ACM Proposed for Sampling
R-51	TSI pipe insulation (West side)	ACM: 25% Amos.	on Workbench: <2,000 struct/cm2	Window glazing (South window)
			on Tank: <2,700 struct/cm2	Presumed built-up roofing material
Pumphouse 4 (P-4)	No Past Data Available			Presumed built-up roofing material
Old Water Tower	TSI pipe insulation (watertower by building)	NAD		Tar shingles 20' south of structure
	associated tar around pipe	ACM: 4% Chrys.		
	TSI pipe air cell (water tower by building outside)	ACM: 45% Chrys.		
Building associated with Water Tower	No Past Data Available			Firedoor
				Tar between cistern and building
				Tar covering on pipe
Pumphouse 3 (P-3)	No Past Data Available			Transite wall
R-21	12"x12" Gray floor tile w/ mastic (South/west entrance)	NAD		Tar on concrete pedestals South of building
	associated mastic	NAD		Floor debris
	9"x9" Tan floor tile (South hallway)	ACM: 6% Chrys.		Sheetrock
	associated mastic	ACM: 3% Chrys.		Cable insulation
	Beige linoleum w/ mastic (South hallway)	ACM: 4% Chrys.		Firedoor
	associated mastic	ACM: 16% Chrys.		Roofing material
	12"x12" Black floor tile w/ mastic (North entrance)	ACM: 4% Chrys.		HVAC noise reducer, tar sealant
	associated mastic	NAD		
	9"x9" Gray floor tile w/ mastic (North/West room)	ACM: 5% Chrys.		
	associated mastic	ACM: 2% Chrys.		
	12"x24" Ceiling tiles (South room)	NAD		
	12"x12" acoustic tile wall ceiling material (North/west room)	NAD		
	Brown ceiling glue dots (North/west room)	NAD		
R-29	No Past Data Available			9"x9" beige floor tiles
				Sheetrock
R-33	No Past Data Available			Cable insulation

**Table 4-4 By-Building Listing of Previously Identified Asbestos Containing Materials and Suspect Materials Proposed for Testing in East Stand**

Building	Materials Tested by J&S Environmental Laboratories	Testing Result (LM, 2005)	Wipe Sampling Results for Asbestos (LM, 2005)	Suspected ACM Proposed for Sampling
Test Stand 2 (R-2)	No Past Data Available			Black pipe
No. 2 Sewage Treatment Plant	No Past Data Available			Gasket insulation at flanges
Test Stand 3 (R-3)	No Past Data Available			Black pipes Black caulking
Scrubber	No Past Data Available			No Suspect Material Found
Cistern/Cistern Pump	No Past Data Available			No Suspect Material Found
Waste Disposal Area	No Past Data Available			No Suspect Material Found
Test Stand 4 (R-4)	TSI in furnace (outside of furnace)	ACM: 15% Chrys.		Transite board on mezzanine
	Thermal brick (outside of furnace)	NAD		White powder
	TSI (outside furnace surface)	ACM: 10% Chrys.		Pipe insulation wrapping/canvas
	TSI pipe insulation (West side)	ACM: 35% Chrys.		2'x4' ceiling tiles
	TSI Fittings / Elbows (middle hallway)	ACM: 8% Chrys.		
	9"x9" Green floor tile w/ mastic (middle hallway)	ACM: 6% Chrys.		
	associated mastic	ACM: 2% Chrys.		
Water Cooling Tower	No Past Data Available			Pipe wrapping SW side
Condenser and Hot well	No Past Data Available			No Suspect Material Found
Effluent Treatment Basin & Agitator	Building not labeled on map			Ceiling sheeting
Transformer Bank	No Past Data Available			To Be Inspected
T-51 (Fuel Oil Tank)	No Past Data Available			To Be Inspected

Abbreviations:

LM - Lockheed Martin

ACM - Asbestos Containing Material

NAD - No asbestos detected

Chrys. - Chrysotile

Amos. - Amosite

## 4 Conclusions and Recommendations

**Table 4-5 Preliminary Results for Lead Detected in Paint Chip Samples  
(Lockheed Martin) RTI Site, Rockaway Township, New Jersey**

Building	Location	Lead (mg/kg)	Paint Definition by 40 CFR Part 745, Subpart 223
R-47	Wall	840	LCP
	Door Jam	1,100	LCP
S-48	Wall	210	LCP
	Bay Door	24,000	LBP
R-4	Vent	120	LCP
	Wall	6,000	LBP
R-21	Wall	1,900	LCP
	Door	5,500	LBP
R-34	Door Jam	2,600	LCP
	Wall	680	LCP
R-43	Outer Door	89,000	LBP
No. 1 Sewage Treatment Plant	Pipe Cistern/Pump	280	LCP

LBP – Lead-based Paint (> 0.5% Lead)

LCP – Lead Containing Paint (between 0.06% and 0.5% Lead)

# 5

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**A**

## **Cultural Report - Hartgen**

## TECHNICAL EVALUATION MEMO

### Cultural Resources, Radiation Technology OU3 Superfund Site

Lake Denmark Road  
Rockaway Township  
Morris County, New Jersey

HAA # 4569-61

**Submitted to:**

Ecology and Environment, Inc.  
368 Pleasantview Drive  
Lancaster, New York 14086

**Prepared by:**

Walter R. Wheeler  
Senior Architectural Historian  
Hartgen Archeological Associates, Inc.

1744 Washington Avenue Ext.  
Rensselaer, New York 12144  
p +1 518 283 0534  
f +1 518 283 6276  
e [hartgen@hartgen.com](mailto:hartgen@hartgen.com)

[www.hartgen.com](http://www.hartgen.com)

An ACRA Member Firm  
[www.acra-crm.org](http://www.acra-crm.org)

November 2012

## **TECHNICAL EVALUATION MEMO: CULTURAL RESOURCES AT THE RADIATION TECHNOLOGY OU3 SUPERFUND SITE**

### **INTRODUCTION**

This section of the Technical Evaluation Memo summarizes the existing information for the 38 buildings or associated structures on the Site that are included in the Project, and will evaluate whether such information is sufficient to evaluate the cultural significance of these buildings prior to sampling, or whether additional investigations may be necessary.

Two representatives from Hartgen Archeological Associates, Inc., Walter R. Wheeler, Senior Architectural Historian, and Roberta S. Jeracka, Architectural Historian Assistant, accompanied representatives from the Army Corps of Engineers, YU & Associates, Ecology and Environment, Inc., and the EPA on a site visit to the former Radiation Technologies campus in Rockaway Township, Morris County, New Jersey, on October 25 and 26, 2012. The intent of the site visit was to collect information pertaining to each standing structure or building, and to evaluate, to the degree possible, its condition and state of preservation.

Each structure was recorded photographically, and field notes detailing salient features of each structure or building were collected. The descriptive information compiled during the field trip is presented in the body of this memo. The review of existing documentation is presented in conclusion.

### **SUMMARY OF EXISTING INFORMATION FOR STANDING STRUCTURES**

#### **East Stand Area**

##### **R-2 (Test Stand 2)**

The remaining portion of this structure, used as a large-size motor test stand, consists of the poured concrete base containing control rooms, is approximately 30 feet high, measured on the southwest side of the structure. Indications of the former steel superstructure, consisting of a number of truncated steel columns, were observed on the top deck of the remaining portion of the structure. The landscape adjacent to this structure was modified into terraces to facilitate entry at multiple levels. Creosoted railroad ties, which remain in place, were used to create retaining walls, forming the terraces.

##### **R-33**

A steel framed structure measuring approximately 9' by 12' in plan and with a 3' by 8' concrete pad adjacent to the north. The superstructure is sheathed with corrugated galvanized steel panels. The interior is undivided and appears to be lined with insulated panels. The shed roof is covered with corrugated galvanized steel panels, and features a vent stack with conical cap. There are no windows in the building; a single door gives access to the interior. This structure originally housed a heat exchanger in support of nitrogen cascade.

##### **Unidentified Structure Adjacent to R-33**

An unidentified structure partially preserved and now consisting of four cast concrete columns with attached electrical panels. Each of the four concrete columns measures approximately 18" square and is about seven feet in height.

## **R-29**

A one-story steel framed insulated building of rectangular plan, measuring approximately 20 by 40 feet, and having a gable roof. The building is sheathed with corrugated galvanized steel panels, and has a standing seam metal roof. There are no windows and the undivided interior is accessed via a pair of doors located in the west end of the south wall. The interior is finished with gypsum wallboard and what may be a metal pan ceiling. The foundation is slab on grade. The interior has suffered from vandalism.

## **R-21**

A control or observation building, this structure consists of a central pavilion constructed of poured concrete walls. Its small window openings and thick exterior walls suggest that it was used as a test observation area. The core of the building is flanked by one-story concrete block wings. All three parts of the building are one story in height, have flat roofs and are built into the side of their sloping side. The concrete block portions of the building have their joints struck to emphasize every other horizontal joint. A moulded concrete capstone extends along the top of the parapet wall of both of the wings. The interior is divided into a number of office and utility spaces. The building appears to have also served as a sewage treatment control center.

## **P-3 (Pump house 3)**

A wood-framed building measuring 8 feet square and 8 feet high, with a shed roof and sheathed with corrugated aluminum panels under which are cementitious boards. Much of the metal sheathing has been removed by looters. The building sits on a poured concrete slab. The interior is undivided and is accessed via a single door. There are no other apertures.

## **R-3 (Test Stand 3)**

A one-story plywood-formed concrete structure used as a testing area. The majority of the structure is presently without a roof, and its original appearance is unknown. This structure is associated with the Scrubber, and served as a rocket motor test stand. No measurements are available for this building.

## **Scrubber**

This structure, which consists of a poured-in-place concrete platform, some of which is cantilevered over a holding area, served as an exhaust scrubber/ effluent treatment area.

## **P-4 (Pump house 4)**

A light steel-framed structure measuring approximately 10 feet by 12 feet in plan, and having a pair of doors giving access to the equipment and a single door for alternate entry. The interior is undivided, and has no interior finishes. The building is sheathed with corrugated galvanized steel panels, and sits on a poured concrete foundation. It was engineered by the John Cooper Company of Hackensack, NJ, according to the builder's plaque. It is in a good state of preservation.

## **Water Towers**

Two water towers, consisting of (1) an elevated cylindrical tank supported by a braced rectangular steel frame on four concrete piers, and (2) a cylindrical sheet iron tank on a poured concrete pad and with an associated cinderblock pump house and associated wood-framed structure with shed roof and sheathed with T-111 siding, which appears to have been recently constructed. Both towers are in a good state of preservation.

Slightly to the north of these towers are a series cast concrete tank cradles and other unidentified support structures.

## **R-51**

A large steel-framed building of rectangular plan and gable roof, sheathed with galvanized corrugated steel panels. A single room, insulated with fiberglass and supplied with windows is enclosed within the otherwise undivided interior, which has no wall or ceiling finish except the metallic paper covering of its insulated panels. No measurements are presently available for this structure. It is believed that this structure served as a boiler house for activities undertaken in building R-4, located to the west.

### **T-51 Fuel Oil Storage Tank**

An above-ground fuel oil storage tank, consisting of a cylindrical steel tank measuring approximately 12 feet in diameter and 16 feet tall, set within a bermed area, and associated with R-51.

### **R-4 Test Stand 4**

This building consists of a plywood-formed concrete high bay area with concrete block office and control bay wing. Both parts of the structure have flat roofs supported by steel trusses. A large amount of instrumentation remains within this structure, which originally served as a rocket motor test stand, together with altitude test chambers. The condenser and hot well structures are associated with this building. No measurements are currently available for this building.

### **Condenser and Hot Well**

The concrete foundation and base of a settling basin with overflows and a discharge pipe for materials discharged from R-4.

### **Cistern/Cistern Pump**

Two six-foot diameter concrete caps on buried vaults, associated with a 4 foot by 6 foot poured concrete slab. The size of the cisterns is not presently known.

### **Sewage Treatment Plant #2**

This structure consists of a steel tank and settling basin covered with metal grating and associated pumping and filtering equipment and a partially-buried cylindrical tank. No measurements are currently available for this structure.

### **Water Cooling Tower**

The water cooling tower is almost entirely constructed of wood and appears to have utilized evaporation caused by air passing over the wetted elements as the agent for cooling. The structure consists of wood laths arranged on racks, with air directed by fins and moved by two large fans. No measurements are presently available for this building.

### **Transformer Bank**

This fenced in area measures 25 feet by 15 feet, and is enclosed on three sides. There is no standing structure at this site.

### **Agitator and Effluent Treatment Basin**

The pump house/agitator measures structure is a wood-framed building 10 feet square. It is sheathed with corrugated galvanized steel sheets, and has a shed roof covered with the same material. It sits on a concrete block foundation and has a single entry door on its east elevation, and no windows. It sits within and is connected to a 21'-6" by 30'-0" cinder block effluent treatment basin.

### **Waste Disposal Area**

The Waste Disposal Area contained no standing structures.

## **P2 Area**

### **Guard house**

A one-story wood-framed structure of square plan, containing a single room. The building is sheathed with corrugated metal siding and has a gable roof. Three of its four sides have large 9-light metal sash windows; the fourth (west) elevation contains the entrance and a three-light window. The building retains most of its interior finishes, which consist of pressboard panels over fiberglass insulation. The building measures approximately six feet square in plan, and is in a fair state of preservation.

### **R-47**

This structure consists of a one-story pre-engineered metal building of rectangular outline and with low gable roof. The builders plaque, indicating its model name “Challenger” and fabrication by Butler, is located at the apex of one of the gable ends. The interior is divided by concrete, concrete block and gypsum wallboard on wood-frame partitions, and is divided into work areas, garage bays and office space. Numerous additions were made to the building over time. This structure was used as a rocket fueling station for the Bullpup B rocket, and contains six rocket fueling bays and a gantry crane to assist in moving the rockets. The building was later used by a fiberglass boat manufacturer and as a machine shop. No measurements are available for this building.

#### **Paint Locker**

A concrete block building measuring approximately 24'-6" by 12'-0", this structure, which has a gable roof, is approximately 15 feet tall. The interior is undivided and has no finishes. The roof is supported by a light steel structure, and is sheathed with galvanized corrugated metal panels. A steel door and two small windows, all with concrete lintels, are located in both of the gable end elevations; two large louvered vents are located in the one of the lateral walls.

#### **Fuel Storage Tank**

This structure consists of a low enclosing wall of board-formed concrete, within which are two short walls which formerly served as tank supports. The fuel storage tank is no longer extant. No measurements are available for this building.

#### **Ignitor Storage**

A one-story light steel framed structure measuring 24'-0" by 12'-0" and 15 feet tall, sheathed with galvanized steel formed to appear like wood clapboards. The gable roof is covered with corrugated galvanized steel panels. The interior is undivided and has no finishes. A builder's plaque for the John Cooper Company of Hackensack, NJ, is affixed to the metal entry door, which is the only aperture in the building. A low berm is located adjacent to the structure. The building is in a very good state of preservation.

#### **Acid (Oxidizer) Storage Tank**

This structure consists of a poured concrete curb wall enclosing an area roughly 30 feet square on three sides, and is three feet high. The storage tanks are no longer extant.

### **P-2 (Pump house 2)**

A one-story light steel framed structure measuring 24'-0" by 12'-0" and 15 feet tall, sheathed with galvanized steel formed to appear like wood clapboards. The gable roof is covered with corrugated galvanized steel panels. The interior is undivided and has no finishes. A builder's plaque for the John Cooper Company of Hackensack, NJ, is affixed to one of the pair of metal entry doors. There are no windows. The building occupies a poured concrete foundation and is in a very good state of preservation.

### **R-43**

This structure consists of a corrugated galvanized steel structure measuring 16 feet wide and 32 feet long, engineered similar to a Quonset and of similar profile. It is undivided on the interior, and is finished with styrofoam insulating panels. Chief access is via bay doors in the gable ends; a small entry on one of the long walls has been closed up. This building has partially collapsed.

### **R-34**

Structure R-34 consists of at least three phases of construction, comprising a corrugated metal building (constructed first), a cinder block building, and a concrete block structure. The corrugated galvanized metal portion of the building is rectangular in plan and has a gable roof. The balance of the structure is one tall story in height and has a flat roof supported by steel framing. All parts of the structure occupy poured concrete or concrete block foundations. The interior is largely finished with and divided by block partitions into work bays and several office spaces. This structure was originally used to test diesel engines. No measurements are presently available for this structure.



## **Storage Area**

There are no structures associated with this feature.

## **South Stand Area**

### **S-12 (Test Stand)**

The existing portions of this structure, used as a test stand, consist entirely of plywood-formed concrete. Terracing of the adjacent landscape permitted the creation of multiple levels at this site, and two vehicular drives. It is unclear whether or not there was a steel superstructure associated with this building; brackets and other connecting devices remain on the upper level. Little of the original instrument panels survive. Doors and other openings have steel frames. A steel tank associated with this structure measures 4 by 6 feet.

### **S-46**

A one-story concrete block structure, constructed in two phases. The roof consists of precast concrete panels on steel trusses. Windows and doors are generally steel-framed. Interior finishes consist of painted concrete block, and pressboard. Where they were installed, ceilings consisted of acoustic tile suspended ceilings. Alterations include the closing of one of the bay doors with concrete block. While the structure of the building is in good condition, the interior finishes are in poor condition due to vandalism and water damage. This structure includes a boiler house, equipment storage area, a machine shop and offices. It was most recently used as a small engine equipment repair and maintenance shop. No measurements are presently available for this structure.

### **T-50**

This structure survives only as a slab-on-grade and base course of the concrete block superstructure. Portions of the original flooring survive.

### **S-11 (Test Stand 11)**

This building consists of a plywood-formed concrete superstructure containing test bays. Fragments of the original corrugated cementitious panel roof survive; bay doors are missing but wood jambs for them remain in part. An adjacent structure survives only as a cinderblock foundation. A small amount of panel equipment survives.

### **S-49 Ignitor Storage Bunkers**

A small wood-framed shed measuring approximately 10 feet square in plan, and with a gable roof, one door and no windows. The exterior and roof are sheathed with corrugated galvanized metal panels. The interior is fitted with styrofoam insulating panels.

### **[S-37] (Test Stand 37)**

This structure is constructed of cinder block and plywood-formed concrete. It retains portions of its corrugated cementitious roof panels, similar to those used in S-49. The test bays are constructed of poured concrete, while the observation and control rooms, which are in a ruinous state, were built from cinder block with a cement panel and steel roof system. This building was originally used as a site for propellant grain preparation, the manufacture of synthetic rubber materials and solid motor mixing and casting. No measurements are available for this structure.

An associated structure of unknown purpose consists of two courses of a cinder block foundation, on top of which are fragments of the collapsed wood-frame superstructure of a small building and its corrugated metal roof.

## **Propane Storage Area**

This structure consists of two board-formed concrete tank supports and an associated chain-link fence enclosure measuring 22'-0" by 31'-6" and seven feet tall. The tank has been removed.

### **Sewage Treatment Plant #1**

This structure consists of a steel tank covered with metal grating and associated pumping and filtering equipment covered with metal cowls. No measurements are currently available for this structure.

#### **S-48**

Only the poured concrete slab-on-grade survives from this structure. Small fragments of what may have been its wood-framed superstructure and corrugated metal roofing are located nearby. The foundation measures approximately 29'-6" by 39'-6". This building was used as an equipment storage shed. More recent uses included a repair shop.

### **CONCLUSION: EVALUATION OF AVAILABLE INFORMATION**

The condition of the buildings and structures on the Radiation Technology OU3 Superfund Site range from poor to good. In addition to information collected during the site visit, a cultural resource reconnaissance survey (CRCG 2007) and a website established by a former employee (Holland 2012) were reviewed for material potentially useful in making a determination of eligibility of the site or any of its component features.

As a result, it has been determined that the information available at present is insufficient to determine the eligibility of the built resources on the site for inclusion on the National Register according to the significance criteria. There are significant gaps in information remaining which will be pertinent to making a determination. Problem areas include:

- The dates of construction for each structure are poorly understood at present. Because of the non-diagnostic nature of most of the building materials utilized in the construction of the buildings and structures on the site, additional historical research will be required to establish the dates of their construction more precisely. The aerial photography included in the cultural resource reconnaissance report on the property (CRCG 2007), is helpful to this end, but additional imagery is needed. This is important in order to establish which buildings and structures were extant during the period of significance.
- A more comprehensive sense of the extent of the built environment and associated landscape during the period of significance needs to be established. An understanding of how much of the campus survives from the significant period needs to be established in order to determine the degree to which the present conditions at the site represent and embody historical conditions. Similarly, the condition of each structure needs to be assessed against period visual documentation, if available, or oral history. The website resource (Holland 2012) includes only a few photographs which can be used in this way.
- The contexts for contemporary facilities, connected to either Cold War Era technological developments or to the space program, need to be reviewed in order to establish the degree to which the present site may be a representative example of such facilities.

### **BIBLIOGRAPHY**

Cultural Resource Consulting Group (CRCG)

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Holland, Bob

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**B**

## **Asbestos and Lead Report - YU**

# MEMORANDUM

## RTI SUPERFUND SITE RECONNAISSANCE FOR HAZARDOUS MATERIALS

### FINDINGS AND LOCATIONS



*Prepared for:*



Ecology & Environment, Inc.  
368 Pleasantview Dr.  
Lancaster, NY 14086

*Prepared by:*



200 Riverfront Blvd.,  
Elmwood Park, NJ 07407

November 15, 2012  
Revised November 19, 2012

## **Introduction**

YU & Associates, Inc. (YU) representatives Leonid Pevzner and George Wang participated in site reconnaissance for the RTI Superfund site on October 25<sup>th</sup> and 26<sup>th</sup>, 2012. Leonid Pevzner is an EPA/AHERA certified Asbestos Inspector, a NJ DCA certified Asbestos Safety Technician and an EPA certified Lead Inspector. George Wang is an EPA/AHERA certified Asbestos Inspector. Additional representatives from EPA (Region 2), Army Corp. of Engineers, Ecology & Environment (E&E), and Hartgen Archeological Associates were also in attendance during the site reconnaissance.

The purpose of the walk through was to confirm the presence and locations of previously tested hazardous materials (hazmat). YU's efforts related to the hazmat areas of asbestos containing materials and lead-based paints in order to identify any potential hazmat not tested or otherwise accounted for in previous inspections, and to determine the level of personal protective equipment that would be required for inspection services and sampling. There are total of 35 structures on site. Altogether, 33 structures were visited and visually inspected as part of this site reconnaissance. The remaining 2 structures will be inspected during the next phase of work within Hazardous Materials Survey.

## **Background Investigation**

Prior to the site visit, YU reviewed the following documents to develop tables recording previous hazardous materials findings for asbestos and lead.

- Sampling Reports of 2005 and 2010 performed by Lockheed Martin (LM);
- EPA Superfund Record of Decision (EPA ID: NJD047684451) of 05/09/1994;
- Remedial Investigation Report Operable Unit 2 performed by Conestoga-Rovers & Associates of 2010.

These tables were used to facilitate an analysis of areas remaining to be sampled for asbestos and lead.

## **Asbestos Containing Materials**

Based on the extent of the initial site reconnaissance walkthrough, our preliminary estimate indicates that there are approximately 60 suspect asbestos materials that need to be collected throughout all visited structures to address data gaps from the existing hazardous material survey. These materials include both friable asbestos materials (that can be crumbled, pulverized, or reduced to powder under the hand pressure as per 40 CFR part 763 NESHAP Regulations) and non-friable organically bound asbestos materials. Not yet sampled suspect ACM include about 25 friable and 35 non-friable materials. A few suspect materials, including fire door insulation, boiler interior lining, and some gasket in flanges are not readily accessible for sampling (would require significant labor efforts). If these materials are not accessible by the time of our full investigation, they would be presumed ACM without sampling.

Table 1.1 depicts the various buildings within the South Stand (as shown on Figure 1 provided by E&E), the materials that were tested along with their testing results, and materials identified for sampling during the site reconnaissance. Table 1.2 depicts the same information for those buildings within the P2 Area and Table 1.3 depicts the same information for those buildings within the East Stand (as shown on Figure 2 provided by E&E).

**TABLE 1.1 - BY-BUILDING LISTING OF PREVIOUSLY IDENTIFIED ASBESTOS CONTAINING MATERIALS AND  
SUSPECT MATERIALS PROPOSED FOR TESTING IN SOUTH STAND**

Building	Materials Tested by J&S Environmental Laboratories	Testing Result (LM, 2005)	Wipe Sampling Results for Asbestos (LM, 2005)	Suspected ACM Proposed for Sampling
S-46 (in LM Report was mistakenly designated as S-48)	TSI Pipe insulation (North/West)	ACM: 35% Chrys.	on Refrigerator: 13,000 struct/cm2	2'x4' ceiling tiles
	TSI Fittings / Elbows (North/West)	ACM: 30% Chrys.	on Fork Lift: 35,000 struct/cm2	9"x9" floor tiles
	TSI pipe insulation (East side)	ACM: 40% Chrys.	on Lawn Mower: <4,000 struct/cm2	Sheetrock wall
	9"x9" Green floor tile w/ mastic (south/west sides)	ACM: 5% Chrys.		Pipe insulation throughout building
	associated mastic	ACM: 5% Chrys.		Presumed built-up roofing material
	12"x24" Ceiling tiles (South/west Side)	NAD		Mastic sampling for VAT and ceiling tiles
	Window glaze (North side)	NAD		
S-48 (demolished)	No Past Data Available			No Suspect Material Found
Test Stand 12	No Past Data Available			Pipe insulation throughout building
				Wall vapor barrier
				Door caulking
				Wire insulation
Test Stand 11	No Past Data Available			No Suspect Material Found
Test Stand 37	No Past Data Available			Caulking
				Tar
				Skim coat over walls
				Green floor tiles in debris
				Tar paper in debris
No. 1 Sewage Treatment Plant	No Past Data Available			Black mastic
				Light blue-green paint
				Black paint
				Gasket insulation at flanges
Propane Storage Area	No Past Data Available			No Suspect Material Found

Abbreviations:

LM - Lockheed Martin

ACM - Asbestos Containing Material

NAD - No asbestos detected

Chrys. - Chrysotile

Amos. - Amosite



**TABLE 1.2 - BY-BUILDING LISTING OF PREVIOUSLY IDENTIFIED ASBESTOS CONTAINING MATERIALS AND  
SUSPECT MATERIALS PROPOSED FOR TESTING IN P2 AREA**

Building	Materials Tested by J&S Environmental Laboratories	Testing Result (LM, 2005)	Wipe Sampling Results for Asbestos (LM, 2005)	Suspected ACM Proposed for Sampling
Ignitor Storage	No Past Data Available			Cloth cushion Gasket cushioning Black paint on sheetrock
Fuel Storage Tank	No Past Data Available			No Suspect Material Found
Paint Locker	No Past Data Available			No Suspect Material Found
R-47	9"x9" Green floor tile w/ mastic (west side by door)	ACM: 12% Chrys.	on ATV: 28,000 struct/cm2	Pipe insulation (by West gate)
	associated mastic	ACM: 10% Chrys.	on Snowmobile: 16,000 struct/cm2	Tar paper outside by the west
	9"x9" Beige floor tile w/ mastic (west side by door)	ACM: 8% Chrys.		Sheetrock
	associated mastic	ACM: 4% Chrys.		Pipe insulation in West Room above ceiling tiles
	12"x24" Ceiling tiles (west side by door)	NAD		Boiler gasket insulation
	TSI Fittings / Elbows	ACM: 10% Chrys.		Firedoor insulation
P-2 (Pumphouse 2)	Transite pipe (outside 30' from door)	ACM: 25% Chrys.		Sheetrock Boiler/Tank insulation Cable insulation
R-43	No Past Data Available			No Suspect Material Found
R-34	9x9" Brown floor tile (west room)	ACM: 12% Chrys.		Sheetrock
	associated mastic	ACM: 5% Chrys.		Tar covering on metal roof
	9"x9" Brown floor tile (west room bathroom)	ACM: 10% Chrys.		Door insulation
	associated mastic	ACM: 4% Chrys.		Cable insulation
	Window glaze (west room window)	ACM: 4% Amos.		Debris Presumed built-up roofing material
Acid (Oxidizer) Storage Tank	No Past Data Available			No Suspect Material Found

Abbreviations:

LM - Lockheed Martin

ACM - Asbestos Containing Material

NAD - No asbestos detected

Chrys. - Chrysotile

Amos. - Amosite

**TABLE 1.3 - BY-BUILDING LISTING OF PREVIOUSLY IDENTIFIED ASBESTOS CONTAINING MATERIALS AND  
SUSPECT MATERIALS PROPOSED FOR TESTING IN EAST STAND**

Building	Materials Tested by J&S Environmental Laboratories	Testing Result (LM, 2005)	Wipe Sampling Results for Asbestos (LM, 2005)	Suspected ACM Proposed for Sampling
R-51	TSI pipe insulation (West side)	ACM: 25% Amos.	on Workbench: <2,000 struct/cm2	Window glazing (South window)
			on Tank: <2,700 struct/cm2	Presumed built-up roofing material
Pumphouse 4 (P-4)	No Past Data Available			Presumed built-up roofing material
Old Water Tower	TSI pipe insulation (watertower by building)	NAD		Tar shingles 20' south of structure
	associated tar around pipe	ACM: 4% Chrys.		
	TSI pipe air cell (water tower by building outside)	ACM: 45% Chrys.		
Building associated with Water Tower	No Past Data Available			Firedoor
				Tar between cistern and building
				Tar covering on pipe
Pumphouse 3 (P-3)	No Past Data Available			Transite wall
R-21	12"x12" Gray floor tile w/ mastic (South/west entrance)	NAD		Tar on concrete pedestals South of building
	associated mastic	NAD		Floor debris
	9"x9" Tan floor tile (South hallway)	ACM: 6% Chrys.		Sheetrock
	associated mastic	ACM: 3% Chrys.		Cable insulation
	Beige linoleum w/ mastic (South hallway)	ACM: 4% Chrys.		Firedoor
	associated mastic	ACM: 16% Chrys.		Roofing material
	12"x12" Black floor tile w/ mastic (North entrance)	ACM: 4% Chrys.		HVAC noise reducer, tar sealant
	associated mastic	NAD		
	9"x9" Gray floor tile w/ mastic (North/West room)	ACM: 5% Chrys.		
	associated mastic	ACM: 2% Chrys.		
	12"x24" Ceiling tiles (South room)	NAD		
	12"x12" acoustic tile wall ceiling material (North/west room)	NAD		
	Brown ceiling glue dots (North/west room)	NAD		
R-29	No Past Data Available			9"x9" beige floor tiles
				Sheetrock
R-33	No Past Data Available			Cable insulation

**TABLE 1.3 - BY-BUILDING LISTING OF PREVIOUSLY IDENTIFIED ASBESTOS CONTAINING MATERIALS AND  
SUSPECT MATERIALS PROPOSED FOR TESTING IN EAST STAND**

Building	Materials Tested by J&S Environmental Laboratories	Testing Result (LM, 2005)	Wipe Sampling Results for Asbestos (LM, 2005)	Suspected ACM Proposed for Sampling
Test Stand 2 (R-2)	No Past Data Available			Black pipe
No. 2 Sewage Treatment Plant	No Past Data Available			Gasket insulation at flanges
Test Stand 3 (R-3)	No Past Data Available			Black pipes
				Black caulking
Scrubber	No Past Data Available			No Suspect Material Found
Cistern/Cistern Pump	No Past Data Available			No Suspect Material Found
Waste Disposal Area	No Past Data Available			No Suspect Material Found
Test Stand 4 (R-4)	TSI in furnace (outside of furnace)	ACM: 15% Chrys.		Transite board on mezzanine
	Thermal brick (outside of furnace)	NAD		White powder
	TSI (outside furnace surface)	ACM: 10% Chrys.		Pipe insulation wrapping/canvas
	TSI pipe insulation (West side)	ACM: 35% Chrys.		2'x4' ceiling tiles
	TSI Fittings / Elbows (middle hallway)	ACM: 8% Chrys.		
	9"x9" Green floor tile w/ mastic (middle hallway)	ACM: 6% Chrys.		
	associated mastic	ACM: 2% Chrys.		
Water Cooling Tower	No Past Data Available			Pipe wrapping SW side
Condenser and Hot well	No Past Data Available			No Suspect Material Found
Effluent Treatment Basin & Agitator	Building not labeled on map			Ceiling sheeting
Transformer Bank	No Past Data Available			To Be Inspected
T-51 (Fuel Oil Tank)	No Past Data Available			To Be Inspected

Abbreviations:

LM - Lockheed Martin

ACM - Asbestos Containing Material

NAD - No asbestos detected

Chrys. - Chrysotile

Amos. - Amosite

### **Asbestos Air Quality Assessment**

To determine what type of personal protection equipment is required for the inspection services and sampling at RTI, a low-volume air pump was set up with a TEM air cassette in building S-46 during the site reconnaissance. This building was selected because it had the highest reading of wipe sampling for asbestos (35,000 structures/cm<sup>2</sup> or 350 structures/mm<sup>2</sup> on the fork lift). Before turning the low-volume air pump on, the floor was swept with a broom to aerosolize the floor dust. The pump operated from 8:30 to 17:40 (a total of 550 min at the average flow rate of 1.7 l/min).

The lab result showed an asbestos concentration in air of <11 structures/mm<sup>2</sup> (lab report is attached). The clearance level for a post-abatement air sample is 70 structures/mm<sup>2</sup>. Sampling results therefore indicate that no special PPE equipment will be needed, except for taking samples of friable asbestos containing materials. For that procedure, a half-face respirator and Tyvek suit would be adequate protection.

### **Lead Based Paints**

Out of the total of 35 structures located on the site, only 7 were previously sampled for lead paint and many painted surfaces within these buildings were not investigated. Lead paint inspection was conducted by Lockheed Martin in 2005 by taking paint chip samples and analyzing them by the Atomic Absorption method. Of the 12 paint samples tested, 4 paints can be defined as lead-based paint (40 CFR Part 745, Subpart 223) with lead content of more than 0.5% : S-48 Bay Door (2.4%), R-4 Wall (0.6%), R-21 Door (0.55%), and R-43 Outer Door (8.9%). The rest of tested paints are defined as lead containing paints having greater than 0.06% but less 0.5% lead content. Results from Lockheed Martin's study are shown in Table 2.

**Table 2 – Preliminary Results for Lead Detected in Paint Chip Samples (Lockheed Martin)  
RTI Site, Rockaway Township, New Jersey**

<b>Building</b>	<b>Location</b>	<b>Lead (mg/kg)</b>	<b>Paint Definition by 40 CFR Part 745, Subpart 223</b>
R-47	Wall	840	LCP
	Door Jam	1,100	LCP
S-48	Wall	210	LCP
	Bay Door	24,000	<b>LBP</b>
R-4	Vent	120	LCP
	Wall	6,000	<b>LBP</b>
R-21	Wall	1,900	LCP
	Door	5,500	<b>LBP</b>
R-34	Door Jam	2,600	LCP
	Wall	680	LCP
R-43	Outer Door	89,000	<b>LBP</b>
No. 1 Sewage Treatment Plant	Pipe Cistern/Pump	280	LCP

LBP – Lead-based Paint (> 0.5% Lead)

LCP – Lead Containing Paint (between 0.06% and 0.5% Lead)

Please note that there is no safe level of lead that may potentially be absorbed by a human body. However, the higher lead concentration in paint, the higher the potential hazard. Therefore, paints in the building components defined as LBP are the most hazardous.

Lead paint was previously identified by LM on a few building components within the structures. Our walk through observations indicates that the other painted surfaces within the buildings are also likely to have lead paint and need to be screened for lead by means of the XRF instrument.

### **Recommendations and Conclusions**

As a result of this site visit to RTI, YU inspectors identified suspect friable and non-friable asbestos containing materials in most of the on-site structures that have not previously been sampled and analyzed. These additional suspect ACMs need to be sampled and analyzed or presumed to be ACM if inaccessible during the next inspection.

Most asbestos sampling can be performed in Level D PPE. When taking samples of friable asbestos containing materials, modified Level C PPE comprised of a half-face respirator and Tyvek suit would provide adequate protection.

Lead inspection and screening using XRF instruments should be performed in all the on-site buildings to address the many untested structures and paint surfaces. YU & Associates will schedule the next phase of inspection, sampling, and screening program with E&E.











# C

## Summary of Previous Sampling Results Sheets

- P2 Area
- South Stand Area
- East Stand Area

Summary of Previous Sampling Results					
Radiation Technology Superfund Site, Rockaway Township, New Jersey					
Area: P2 Area			Structure/Building: R-47		
Historic Use: Former rocket fuel loading bays for the Bullpup B rocket with six rocket fueling bays with an overhead crane and tracks to move the rockets. Rocket motor assembly, leased later to fiberglass boat manufacturer. Used as a machine shop, auto restoration.					
Summary of Site Walk conducted on 10/25/12: R-47 is currently an unoccupied large building/warehouse with galvanized sheet metal, steel framing, and utilities. An AST (possibly a heating oil tank) was observed on the west side of the building. Debris (drums, tires, metal, wood, insulation, rock cores) observed inside the building. Building contains beige and green floor tiles, fluorescent fixtures, and electrical equipment. No PID readings above background in ambient air. PID readings for the drums: blue plastic drum 3/4 full (90 ppm), green/white drum dextron <1/2 full (60 ppm), red/white/blue drum contained sludge or ignitable (19 ppm), red drum with 10W/30 oil which was full (15 ppm). An expansion tank was observed outside the boiler room on the northwest side of the building, and a vent pipe exiting the ground was also observed in this area. The vent pipe may be for a UST, or may be part of the boiler system. Concrete vaults/chutes were noted on the northeast side of the building.					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances*
Lockheed Martin 2005	UP-3	Surface Soil	3/15/2005	PCBs	1000 µg/kg
Lockheed Martin 2005	UP-4	Surface Soil	3/15/2005	PCBs	110 µg/kg
Lockheed Martin 2005	R-47 Wall	Paint chips	3/15/2005	Lead ICAP	840 mg/kg
Lockheed Martin 2005	R-47 Door Jam	Paint chips	3/15/2005	Lead ICAP	1100 mg/kg
Lockheed Martin 2005	315-10 (West side by door)	Green floor tile	3/15/2005	PACM	12% Chrysotile
Lockheed Martin 2005	315-11 (West side by door)	Mastic under green floor tile	3/15/2005	PACM	10% Chrysotile
Lockheed Martin 2005	315-12 (West side by door)	Beige floor tile	3/15/2005	PACM	8% Chrysotile
Lockheed Martin 2005	315-13 (West side by door)	Mastic under floor tile	3/15/2005	PACM	4% Chrysotile
Lockheed Martin 2005	315-14 (West side by door)	Ceiling tile	3/15/2005	PACM	No Asbestos Detected.
Lockheed Martin 2005	315-15 (Boiler room)	TSi elbow and fittings	3/15/2005	PACM	10% Chrysotile
Lockheed Martin 2010	R-47A	Sub-slab soil	3/24/2010	TAL Metals	Antimony 1J mg/kg, Arsenic 2.2 mg/kg, Cadmium 1.8 mg/kg, Copper 68.1 mg/kg, Iron 11,700 mg/kg, Lead 71.9 mg/kg, Nickel 16.5 mg/kg, Potassium 290J mg/kg, Vanadium 15.6 mg/kg, Zinc 579 mg/kg
Lockheed Martin 2010	R-47B	Sub-slab soil	3/24/2010	TAL Metals	Aluminum 14,300 mg/kg, Antimony 0.79J mg/kg, Arsenic 4.1 mg/kg, Iron 20,900 mg/kg, Manganese 606J mg/kg, Nickel 14.4 mg/kg, Potassium 423J mg/kg, Vanadium 40.3 mg/kg
Lockheed Martin 2010	R-47C	Sub-slab soil	3/24/2010	TAL Metals	Antimony 1.3J mg/kg, Arsenic 2.9 mg/kg, Cobalt 15.5 mg/kg, Iron 11,900 mg/kg, Lead 63.9 mg/kg, Manganese 183J mg/kg, Nickel 8 mg/kg, Potassium 587 mg/kg, Vanadium 9.3 mg/kg, Zinc 134 mg/kg
Lockheed Martin 2010	R-47A	Sub-slab soil	3/24/2010	Energetics	None
Lockheed Martin 2010	R-47B	Sub-slab soil	3/24/2010	Energetics	None
Lockheed Martin 2010	R-47C	Sub-slab soil	3/24/2010	Energetics	None
Lockheed Martin 2010	R-47A	Sub-slab soil	3/24/2010	VOCs/SVOCs	Pyrene 1100 µg/kg, Benzo(b)fluoranthene 820 µg/kg, Benzo(a)pyrene 520 µg/kg
Lockheed Martin 2010	R-47B	Sub-slab soil	3/24/2010	VOCs/SVOCs	Benzo(a)pyrene 270J µg/kg
Lockheed Martin 2010	R-47C	Sub-slab soil	3/24/2010	VOCs/SVOCs	Benzo(b)fluoranthene 670J µg/kg, Benzo(a)pyrene 440J µg/kg
CRA 2010	SS50	Surface Soil	9/22/2008	VOCs/SVOCs/Metals/Energetics/pH/ TOC/TS	None
CRA 2010	SS51	Surface Soil	9/22/2008	VOCs/SVOCs/Metals/Energetics/pH/ TOC/TS	Mercury 0.10J mg/kg
CRA 2010	SS52	Surface Soil	9/22/2008	VOCs/SVOCs/Metals/Energetics/pH/ TOC/TS	None
CRA 2010	SS53	Surface Soil	9/22/2008	VOCs/SVOCs/Metals/Energetics/pH/ TOC/TS	None
CRA 2010	SS59	Surface Soil	9/22/2008	VOCs/SVOCs/Metals/Energetics/pH/ TOC/TS	None
CRA 2010	SS60	Surface Soil	9/22/2008	VOCs/SVOCs/Metals/Energetics/pH/ TOC/TS	Cadmium 1.1J mg/kg

Notes:

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

J = Estimated (compound detected below detection limit)

\* Exceedances for samples in the CRA 2010 report were screened against the NJDEP Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and UPL95 Background Reference (10 background soil samples analyzed for TAL Metals). Exceedances for samples from the Lockheed Martin 2010 report were screened against the action limits from the RI/FS Work Plan-OU2 by CRA.

Summary of Previous Sampling Results					
Radiation Technology Superfund Site, Rockaway Township, New Jersey					
Area: P2 Area			Structure/Building: R-34		
Historic Use: Previously used to test diesel engines. Contained two diesel test stands, mufflers exiting the building through the roof.					
Summary of Site Walk conducted on 10/25/12: Building (approximately 80 by 75 feet) consisting of a combination of concrete block and sheet metal. Building contained debris (RAD Nuts), fluorescent fixtures, floor tiles (reddish color), a 250-gal AST (heating oil tank), miscellaneous scrap metal, and tongue and groove wood scraps. A concrete tank stand was also observed outside of the building on the west side. No PID readings above background.					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances*
Lockheed Martin 2005	R-34 Door Jam	Paint chips	3/15/2005	Lead ICAP	2600 mg/kg
Lockheed Martin 2005	R-34 Wall	Paint chips	3/15/2005	Lead ICAP	680 mg/kg
Lockheed Martin 2005	315-05 (West room)	Brown floor tile	3/15/2005	PACM	12% Chrysotile
Lockheed Martin 2005	315-06 (West room)	Mastic under brown floor tile	3/15/2005	PACM	5% Chrysotile
Lockheed Martin 2005	315-07 (Bathroom by West room)	Brown floor tile	3/15/2005	PACM	10 % Chrysotile
Lockheed Martin 2005	315-08 (Bathroom by West room)	Mastic under brown floor tile	3/15/2005	PACM	4% Chrysotile
Lockheed Martin 2005	315-09 (West room window)	TSI pipe insulation	3/15/2005	PACM	4% Anthophyllite
Lockheed Martin 2005	UP-2	Surface Soil	3/15/2005	PCBs	None
Lockheed Martin 2010	R-34A	Subsurface Soil	3/24/2010	TAL Metals	Aluminum 7910 mg/kg, Antimony 0.69J mg/kg, Arsenic 3.6 mg/kg, Iron 20,400 mg/kg, Manganese 310J mg/kg, Nickel 13 mg/kg, Potassium 519J mg/kg, Selenium 0.68J mg/kg, Vanadium 29.4 mg/kg
Lockheed Martin 2010	R-34B	Subsurface Soil	3/24/2010	TAL Metals	Antimony 0.62J mg/kg, Arsenic 1.8 mg/kg, Iron 17,700 mg/kg, Nickel 7.7 mg/kg, Potassium 316J mg/kg, Vanadium 36.6 mg/kg
Lockheed Martin 2010	R-34A	Subsurface Soil	3/24/2010	Energetics/VOCs	None
Lockheed Martin 2010	R-34B	Subsurface Soil	3/24/2010	Energetics/VOCs	None
Lockheed Martin 2010	R-34A	Subsurface Soil	3/24/2010	SVOCs	Benzo(b)fluoranthene 730J µg/kg, Benzo(a)pyrene 440J µg/kg
Lockheed Martin 2010	R-34B	Subsurface Soil	3/24/2010	SVOCs	Benzo(a)pyrene 330J µg/kg
CRA 2010	SB50	Subsurface Soil	9/19/2008	Energetics/VOCs/SVOCs/Metals/pH/ TS/TOC	Mercury 0.25 mg/kg
CRA 2010	SB52	Subsurface Soil	9/19/2008	Energetics/VOCs/SVOCs/Metals/pH/ TS/TOC	None
CRA 2010	SB50	Surface Soil	9/19/2008	Energetics/VOCs/SVOCs/Metals/pH/ TS/TOC	Antimony 6.6J mg/kg, Cadmium 1.7J mg/kg, Mercury 4.5 mg/kg
CRA 2010	SB52	Surface Soil	9/19/2008	Energetics/VOCs/SVOCs/Metals/pH/ TS/TOC	None

Notes:  
 mg/kg = milligrams per kilogram  
 µg/kg = micrograms per kilogram  
 J = Estimated (compound detected below detection limit)

\* Exceedances for samples in the CRA 2010 report were screened against the NJDEP Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and UPL95 Background Reference (10 background soil samples analyzed for TAL Metals). Exceedances for samples from the Lockheed Martin 2010 report were screened against the action limits from the RI/FS Work Plan-OU2 by CRA.

Summary of Previous Sampling Results					
Radiation Technology Superfund Site, Rockaway Township, New Jersey					
Area: P2 Area			Structure/Building: R-43		
Historic Use: No historical use listed for this location.					
Summary of Site Walk conducted on 10/25/12: Collapsed corrugated steel building (16' X 32') which contains old couches, washing machine, refrigerator, tires, and an empty 30 gallon barrel (PA Refining Co., Butler, PA). The floor is believed to be asphalt. No PID readings above background.					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances*
CRA 2010	SB50	Subsurface Soil	9/19/2008	Energetics/VOCs/SVOCs/Metals/pH/ TS/TOC	Mercury 0.25 mg/kg
CRA 2010	SB50	Surface Soil	9/19/2008	Energetics/VOCs/SVOCs/Metals/pH/ TS/TOC	Antimony 6.6J mg/kg, Cadmium 1.7J mg/kg, Mercury 4.5 mg/kg
Lockheed Martin 2005	UP-2	Surface Soil	3/15/2005	PCBs	None
Lockheed Martin 2005	R-43 Outer Door	Paint chips	3/15/2005	Lead ICAP	89,000 mg/kg

Notes:

mg/kg = milligrams per kilogram

\* Exceedances for samples included in the CRA 2010 report were screened against the NJDEP Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and UPL95 Background Reference (10 background soil samples analyzed for TAL Metals).

Summary of Previous Sampling Results					
Radiation Technology Superfund Site, Rockaway Township, New Jersey					
Area: P2 Area			Structure/Building: Paint Locker (outside of R-47)		
Historic Use: Paint Locker					
Summary of Site Walk conducted on 10/25/12: Cinderblock building (12'L X24.5'W X 15'H) and a metal roof. Core boxes and "RAD" Nut cases observed inside the building. Louver vents on the side of the building. No PID readings above background.					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances*
CRA 2010	SS56	Surface Soil	9/22/2008	VOCs/SVOCs/Metals/Energetics/pH/ TOC/TS	Mercury 0.61 mg/kg
CRA 2010	SS57	Surface Soil	9/22/2008	VOCs/SVOCs/Metals/Energetics/pH/ TOC/TS	None

Notes:

mg/kg = milligrams per kilogram

Sample SS82 is near the paint locker but appears to have not been analyzed, does not appear on any previous tables.

\* Exceedances were screened against the NJDEP Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and UPL95 Background Reference (10 background soil samples analyzed for TAL Metals).

Summary of Previous Sampling Results					
Radiation Technology Superfund Site, Rockaway Township, New Jersey					
Area: P2 Area			Structure/Building: P-2 (Pump House 2)		
Historic Use: Water Pump House					
Summary of Site Walk conducted on 10/25/12: Steel side with metal frame building (12'L X 24'W X 15'H) with a water tank and electrical equipment inside, and a circular concrete vault containing a water main valve was located outside. No PID readings above background. No previous samples were collected in or around this building.					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances
Lockheed Martin 2005	315-04 (P-2)	transite pipe	3/15/2005	PACM	25% Chrysotile

Summary of Previous Sampling Results					
Radiation Technology Superfund Site, Rockaway Township, New Jersey					
Area: P2 Area			Structure/Building: Ignitor Storage		
Historic Use: Ignitor Storage					
Summary of Site Walk conducted on 10/25/12: The ignitor storage bunker is currently an unoccupied small building with steel siding and a metal frame surrounded by earth berm (24'L X12'W X15'H). No PID readings above background. The building contained drywall debris, drums and wood crates.					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances*
CRA 2010	SS63	Surface Soil	9/22/2008	Energetics/metals/pH/TOC/TS	None
CRA 2010	SS62	Surface Soil	9/22/2008	Energetics/metals/pH/TOC/TS	None

Note:

\* Exceedances for samples included in the CRA 2010 report were screened against the NJDEP Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and UPL95 Background Reference (10 background soil samples analyzed for TAL Metals).



Summary of Previous Sampling Results					
Radiation Technology Superfund Site, Rockaway Township, New Jersey					
Area: P2 Area			Structure/Building: Fuel Storage Area		
Historic Use: Fuel Storage					
Summary of Site Walk conducted on 10/25/12: Only a concrete foundations exists, no tanks are present.					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances*
CRA 2010	SS54	Surface Soil	9/22/2008	Energetics/pH/TOC/TS	None
CRA 2010	SS55	Surface Soil	9/22/2008	Energetics/pH/TOC/TS	None

Note:

\* Exceedances for samples included in the CRA 2010 report were screened against the NJDEP Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and UPL95 Background Reference (10 background soil samples analyzed for TAL Metals).

<div>Summary of Previous Sampling Results</div> <div>Radiation Technology Superfund Site, Rockaway Township, New Jersey</div>					
Area: P2 Area			Structure/Building: Acid (Oxidizer) Storage Tanks		
Historic Use: Acid Oxidizer					
<div>Summary of Site Walk conducted on 10/25/12:</div> <div>Observed a concrete containment area (30'X30'x3' high). The containment area was filled with coiled plastic debris (possibly waste form the "RAD" nut and bolt maufacturing process). A water hydrant and possibly a bleeder valve is located in the north end. The water hydrant contained heat-tape around the pipe. Associated AST piping to R-47 was not observed, and may or may not still be in place. No PID readings above background.</div>					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances
No samples previously collected.					

<div>Summary of Previous Sampling Results</div> <div>Radiation Technology Superfund Site, Rockaway Township, New Jersey</div>					
Area: South Stand Area			Structure/Building: S-49		
Historic Use: Exhaust tank with underground cisterns.					
Summary of Site Walk completed on 10/25/12: Pile of debris which contains concrete/cinderblock remains for the exhaust tank and potentially underground cisterns.					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances
No samples previously collected.					

<div>Summary of Previous Sampling Results</div> <div>Radiation Technology Superfund Site, Rockaway Township, New Jersey</div>					
Area: South Stand Area			Structure/Building: T-50		
Historic Use: Unknown.					
Summary of Site Walk completed on 10/25/12: A bare concrete pad approximately 15 by 30 feet.					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances
No samples previously collected.					

**Summary of Previous Sampling Results**  
**Radiation Technology Superfund Site, Rockaway Township, New Jersey**

Area: **South Stand Area**

Structure/Building: **Test Stand 37 (S-37)**

Historic Use: Solid motor mixing and casting.

**Summary of Site Walk completed on 10/25/12:** Concrete and steel structure with three test bays. Observed scattered debris (cinderblocks, metal, wood, and one or two rusty drums on the NE side). Green floor tiles observed inside. No PID readings were above background. Air handler remains, water tank and 5-gallon buckets observed inside.

Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances*
CRA 2010	SB65	Surface and subsurface soil	9/19/2008	VOCs/SVOCs/Energetics/metals/pH/TOC/TS	Cadmium 2.3 mg/kg, Lead 162 mg/kg, Mercury 0.19 mg/kg
CRA 2010	SB74	Surface and subsurface soil	9/19/2008	VOCs/SVOCs/Energetics/metals/pH/TOC/TS	None
CRA 2010	SB75	Surface and subsurface soil	9/19/2008	VOCs/SVOCs/Energetics/metals/pH/TOC/TS	None
CRA 2010	SB76	Surface and subsurface soil	9/19/2008	VOCs/SVOCs/Energetics/metals/pH/TOC/TS	None

Notes:

mg/kg = milligrams per kilogram

\* Exceedances for samples in the CRA 2010 report were screened against the NJDEP Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and UPL95 Background Reference (10 background soil samples analyzed for TAL Metals).

**Summary of Previous Sampling Results**  
**Radiation Technology Superfund Site, Rockaway Township, New Jersey**

Area: **South Stand Area**

Structure/Building: **Test Stand 12 (S-12)**

Historic Use: Rocket motor test stand.

**Summary of Site Walk completed on 10/25/12:** Multi-story concrete and steel structure with two test bays and a control room with a floor drain. Observed a floor drain, PACM pipe insulation and fluorescent fixtures. Walls are 2 feet thick and contain several holes and pipes through the walls. Also observed standard light fixtures, electrical panels and tire storage in several rooms.

**Existing Data**

Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances*
CRA 2010	SB71	Surface and subsurface soil	9/19/2008	VOCs/SVOCs/Energetics/metals/pH/TOC/TS	Cadmium 4.8 mg/kg, Lead 91.8J mg/kg
CRA 2010	SB72	Surface and subsurface soil	9/19/2008	VOCs/SVOCs/Energetics/metals/pH/TOC/TS	Cadmium 2.4 mg/kg, Lead 94.3J mg/kg, Mercury 0.11J mg/kg, Nickel 31.3 mg/kg

Notes:

mg/kg = milligrams per kilogram

\* Exceedances were screened against the NJDEP Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and UPL95 Background Reference (10 background soil samples analyzed for TAL Metals).

**Summary of Previous Sampling Results**  
**Radiation Technology Superfund Site, Rockaway Township, New Jersey**

Area: **South Stand Area**

Structure/Building: **Test Stand 11 (S-11)**

Historic Use: Rocket motor test stand

**Summary of Site Walk completed on 10/25/12:** Concrete and steel structure with three test bays. The concrete foundation remains of the test stand, which is divided into three sections by concrete walls. No PID readings above background. An empty 55-gallon drum was observed on the south side of S-11. Approximately 75' east of S-11 is the remnant of a concrete building, cinderblock debris, some concrete walls, and empty drums believed to be S-49 (Exhaust tank with underground cistern) and an igniter storage bunker. NE of S-11 is a galvanized shed (approximately 8'X10'), which is surrounded by a chain-link fence. The galvanized shed contains general debris (rugs and Styrofoam insulation).

Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances*
CRA 2010	SB70A	Surface soil	9/19/2008	VOCs/SVOCs/Energetics/metals/pH/TOC/TS	Benz(a)pyrene 1400 µg/kg, Benzo(b)fluoranthene 2300 µg/kg, Benzo(a)anthracene 1300 µg/kg, Dibenzo(a,h)anthracene 270 µg/kg, Indeno(1,2,3-cd)pyrene 670 µg/kg
CRA 2010	SB70B	Subsurface soil	9/19/2008	VOCs/SVOCs/Energetics/metals/pH/TOC/TS	Benz(a)pyrene 370 µg/kg, Benzo(b)fluoranthene 610 µg/kg
CRA 2010	SB73A	Surface soil	9/19/2008	VOCs/SVOCs/Energetics/metals/pH/TOC/TS	Manganese 714J mg/kg, Mercury 0.10J mg/kg
CRA 2010	SB73B	Subsurface soil	9/19/2008	VOCs/SVOCs/Energetics/metals/pH/TOC/TS	None
CRA 2010	SB90A	Surface soil	9/19/2008	VOCs/SVOCs/Energetics/metals/pH/TOC/TS	Mercury 0.26 mg/kg
CRA 2010	SB90B	Subsurface soil	9/19/2008	VOCs/SVOCs/Energetics/metals/pH/TOC/TS	None

Notes:

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

\* Exceedances were screened against the NJDEP Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and UPL95 Background Reference (10 background soil samples analyzed for TAL Metals).



Summary of Previous Sampling Results					
Radiation Technology Superfund Site, Rockaway Township, New Jersey					
Area: South Stand Area			Structure/Building: S-48		
Historic Use: Equipment storage, lawnmower repair/salvage shop, and a private automotive repair garage.					
Summary of Site Walk completed on 10/25/12: Bare concrete pad (29.5' X 39.5') with MW-12D located north of the pad. No PID readings above background. Concrete vaults observed on the ground surface at the north end, also observed empty rusty drum (no PID readings above background) adjacent to the vaults or from drum.					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances*
Lockheed Martin 2005	S-48 Wall	Paint chips	3/15/2005	Lead ICAP	210 mg/kg
Lockheed Martin 2005	S-48 Bay Door	Paint chips	3/15/2005	Lead ICAP	24,000 mg/kg
Lockheed Martin 2005	315-19	TSI pipe insulation	3/15/2005	PACM	40% Chrysotile
Lockheed Martin 2005	315-20	Green floor tile	3/15/2005	PACM	5% Chrysotile
Lockheed Martin 2005	315-21	Mastic under green floor tile	3/15/2005	PACM	5 % Chrysotile
Lockheed Martin 2005	315-22	Ceiling tile	3/15/2005	PACM	No asbestos detected.
Lockheed Martin 2005	315-23	Window glaze	3/15/2005	PACM	No asbestos detected.
Lockheed Martin 2005	UP-5	Surface Soil	3/15/2005	PCBs	300 µg/kg
CRA 2010	SB60A	Surface soil	9/19/2008	Energetics/VOCs/SVOCs/metals/pH/TOC/TS	Cadmium 4.6 J mg/kg
CRA 2010	SB60B	Subsurface soil	9/19/2008	Energetics/VOCs/SVOCs/metals/pH/TOC/TS	Cadmium 1.4 J mg/kg
CRA 2010	SB61	Surface and subsurface soil	9/19/2008	Energetics/VOCs/SVOCs/metals/pH/TOC/TS	None

Notes:

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

\* The exceedances for samples in CRA 2010 were screened against the NJDEP Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and UPL95 Background Reference (10 background soil samples analyzed for TAL Metals).

Summary of Previous Sampling Results					
Radiation Technology Superfund Site, Rockaway Township, New Jersey					
Area: South Stand Area			Structure/Building: S-46		
Historic Use: It was historically used as a boiler house, equipment storage, machine shop, and offices. Most recently, appears to have been used for the repair and maintenance of small engine equipment such as lawn mowers.					
Summary of Site Walk completed on 10/25/12: Warehouse consisting of concrete block and a metal roof. No PID readings above background. NW side of building contains lawn equipment and debris. SW side of building is empty, appears to be a maintenance garage and has an eyewash stand. Broken glass (fluorescence tubes) and piles of pipe insulation (white debris/PACM) were observed on the floor. Green 9X9 tiles also observed in the building. YU collected asbestos air samples from within S-46. A steel tank (4'X6') was observed across the road (south) , which did not have any PID readings above background, appears to be empty.					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances*
Lockheed 2010	S-46A	Sub-slab soil	3/24/2010	TAL metals	Antimony 0.52J mg/kg, Arsenic 2.4 mg/kg, Iron 14,200 mg/kg, Manganese 328J mg/kg, Nickel 12.4 mg/kg, Potassium 461J mg/kg, Vanadium 15.8 mg/kg
Lockheed 2010	S-46B	Sub-slab soil	3/24/2010	TAL metals	Antimony 8.4 mg/kg, Arsenic 8.5 mg/kg, Cadmium 11.4 mg/kg, Chromium 109 mg/kg, Copper 275 mg/kg, Iron 72,300 mg/kg, Lead 675 mg/kg, Manganese 421J mg/kg, Nickel 54.4 mg/kg, Potassium 716 mg/kg, Vanadium 15.2 mg/kg, Zinc 1390 mg/kg
Lockheed 2010	S-46A	Sub-slab soil	3/24/2010	Energetics	None
Lockheed 2010	S-46B	Sub-slab soil	3/24/2010	Energetics	None
Lockheed 2010	S-46A	Sub-slab soil	3/24/2010	VOCs	None
Lockheed 2010	S-46B	Sub-slab soil	3/24/2010	VOCs	None
Lockheed 2010	S-46A	Sub-slab soil	3/24/2010	SVOCs	Benzo(a)pyrene 350 J µg/kg
Lockheed 2010	S-46B	Sub-slab soil	3/24/2010	SVOCs	Pyrene 1100 µg/kg, Benzo(b)fluoranthene 700 µg/kg, Benzo(a)pyrene 500 µg/kg
CRA 2010	SB62	Surface and subsurface soil	9/19/2008	Energetics/VOCs/SVOCs/metals/pH/TOC/TS	None
CRA 2010	SB63A	Surface soil	9/19/2008	Energetics/VOCs/SVOCs/metals/pH/TOC/TS	None
CRA 2010	SB63B	Subsurface soil	9/19/2008	Energetics/VOCs/SVOCs/metals/pH/TOC/TS	Aluminum 19900 mg/kg
CRA 2010	SB64A	Surface soil	9/19/2008	Energetics/VOCs/SVOCs/metals/pH/TOC/TS	None
CRA 2010	SB64B	Subsurface soil	9/19/2008	Energetics/VOCs/SVOCs/metals/pH/TOC/TS	Aluminum 18400 mg/kg

Notes:

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

\* Exceedances for samples in the CRA 2010 report were screened against the NJDEP Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and UPL95 Background Reference (10 background soil samples analyzed for TAL Metals). Exceedances for samples from the Lockheed Martin 2010 report were screened against the action limits from the RI/FS Work Plan-OU2 by CRA.

<div>Summary of Previous Sampling Results</div> <div>Radiation Technology Superfund Site, Rockaway Township, New Jersey</div>					
Area: South Stand Area			Structure/Building: Propane Storage Area		
Historic Use: Propane storage area					
<div>Summary of Site Walk completed on 10/25/12:</div> <div>The propane storage area is currently a chain-link fence with barbed wire located around the area (22'L X 31.5'W X 7'H) with a piping and concrete slab over the entire area. All propane tanks have been removed. No PID readings above background. Trees approximately 15 to 20 years old growing inside area.</div>					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances
No samples collected.					

Summary of Previous Sampling Results					
Radiation Technology Superfund Site, Rockaway Township, New Jersey					
Area: South Stand Area			Structure/Building: No. 1 Sewage Treatment Plant		
Historic Use: Sewage Treatment Plant					
Summary of Site Walk completed on 10/25/12: Currenltly an unused separator chamber and effluent tank. No PID readings above background. Monitoring well (MW-101) located in low area downgradient of the sewage treatment unit.					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances*
CRA 2010	SB59	Surface soil	9/19/2008	VOCs/SVOCs/Energetics/metals/pH/TOC/TS	Cadmium 1.0J mg/kg, Lead 78.2J mg/kg, Mercury 7.4 mg/kg

Notes:

mg/kg = milligrams per kilogram

\* Exceedances were screened against the NJDEP Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and UPL95 Background Reference (10 background soil samples analyzed for TAL Metals).

Summary of Previous Sampling Results					
Radiation Technology Superfund Site, Rockaway Township, New Jersey					
Area: <b>East Stand Area</b>			Structure/Building: <b>Condenser and Hot Well</b>		
Historic Use: Condenser and hot well for overflow from testing performed in R-4.					
Summary of Site Walk conducted on 10/26/12: The Condenser and Hot Well consists of a concrete settling basin with one large chamber that overflows into a second smaller chamber, which has an opening that allowed discharge to the surface. The condenser and hot well received fluids from Test Stand 4 (R-4), which were carried in above ground piping (removed) to the structure.					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances*
CRA 2010	SB81B	Subsurface Soil	9/23/2008	Metals/Energetics/TS	None
CRA 2010	SB82B	Subsurface Soil	9/23/2008	Metals/Energetics/TS	None
CRA 2010	SB83B	Subsurface Soil	9/23/2008	Metals/Energetics/TS	None
CRA 2010	SB81A	Surface Soil	9/23/2008	VOCs/Metals/pH/ TOC/TS	None
CRA 2010	SB82A	Surface Soil	9/23/2008	VOCs/Metals/pH/ TOC/TS	Mercury 0.21 mg/kg
CRA 2010	SB83A	Surface Soil	9/23/2008	VOCs/Metals/pH/ TOC/TS	None

Notes:

mg/kg = milligrams per kilogram

\* Exceedances were screened against the NJDEP Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and UPL95 Background Reference (10 background soil samples analyzed for TAL Metals).

<div>Summary of Previous Sampling Results</div> <div>Radiation Technology Superfund Site, Rockaway Township, New Jersey</div>					
Area: East Stand Area			Structure/Building: Cistern and Cistern Pump		
Historic Use: The historical use is unknown.					
Summary of Site Walk conducted on 10/25/12: The Cistern/Cistern Pump consists of two, 6-foot diameter concrete lids on buried vaults adjacent to a 4-foot by 6-foot concrete slab. These vaults were observed to be filled with water during the site walkover. No PID readings above background.					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances
No samples collected.					

<div>Summary of Previous Sampling Results</div> <div>Radiation Technology Superfund Site, Rockaway Township, New Jersey</div>					
Area: East Stand Area			Structure/Building: Waste Disposal Area		
Historic Use: Waste Disposal					
<div>Summary of Site Walk conducted on 10/25/12: The Waste Disposal Area is located approximately 150 feet east of R-47. The area is situated in the woods and contains miscellaneous debris including an empty rusted 55 gallon drum, metal debris, and metal piping. No PID readings above background.</div>					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances
No samples collected.					

Summary of Previous Sampling Results					
Radiation Technology Superfund Site, Rockaway Township, New Jersey					
Area: East Stand Area			Structure/Building: Agitator and Effluent Treatment Basin		
Historic Use: Watrer Pump House					
Summary of Site Walk conducted on 10/25/12: The Agitator and Effluent Treatment Basin includes a small building (10 by 10 feet) with a lower basin (22 by 30 feet). The lower basin is surrounded by 3-foot concrete wall with a concrete overflow that discharges to the east. No PID readings above background.					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances*
CRA 2010	SD57	Sediment	9/24/2008	Metals/pH/TS/grain size	Copper 38.9 mg/kg

Notes:

mg/kg = milligrams per kilogram

\* Exceedances were screened against the NJDEP Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and UPL95 Background Reference (10 background soil samples analyzed for TAL Metals).



<div>Summary of Previous Sampling Results</div> <div>Radiation Technology Superfund Site, Rockaway Township, New Jersey</div>					
Area: East Stand Area			Structure/Building: Transformer Bank		
Historic Use: Transformer bank					
<div>Summary of Site Walk conducted on 10/25/12: All that remains of the Transformer Bank is a chain-link fence approximately 25 feet by 15 feet (three sides). Power poles are located adjacent to the fenced area and one power pole is also located inside fenced area. No concrete pads or transformer support structures were observed within the fenced area during the site walkover.</div>					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances
No samples collected.					

Summary of Previous Sampling Results					
Radiation Technology Superfund Site, Rockaway Township, New Jersey					
Area: East Stand Area			Structure/Building: Water Cooling Tower		
Historic Use: Water cooling tower.					
Summary of Site Walk conducted on 10/25/12: Wooden structure with fans on the roof and concrete foundation. Observed that it was filled with water on the inside. There was piping along the outside, some square vaults on the north side, and electrical panels on the east side. No PID readings above background.					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances*
CRA 2010	SB85	Subsurface soil	9/23/2008	energetics/metals/TS	None
CRA 2010	SB86	Subsurface soil	9/23/2008	energetics/metals/TS	None

Notes:

\* Exceedances were screened against the NJDEP Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and UPL95 Background Reference (10 background soil samples analyzed for TAL Metals).

**Summary of Previous Sampling Results**  
**Radiation Technology Superfund Site, Rockaway Township, New Jersey**

Area: **East Stand Area**

Structure/Building: **Scrubber**

Historic Use: A scrubber building which was designed to clean exhaust gases from test firings of rocket motors.

**Summary of Site Walk conducted on 10/25/12:** Observed concrete foundation remains which appear to have collected material from rocket tests performed at Test Stand R-3. The material would have passed through the scrubber, into what appears to be a settling basin with an overflow that ultimately discharged to the west through an opening. A large concrete saddle for an AST (AST has been removed) is also located west of the scrubber.

**Existing Data**

Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances*
CRA 2010	SB77B	Subsurface Soil	9/22/2008	VOCs/Metals/Energetics/TS	None
CRA 2010	SB78B	Subsurface Soil	9/22/2008	VOCs/Metals/Energetics/TS	None
CRA 2010	SB89B	Subsurface Soil	9/23/2008	VOCs/Metals/Energetics/TS	None
CRA 2010	SB78A	Surface Soil	9/22/2008	VOCs/Metals/pH/ TOC/TS	None
CRA 2010	SB89A	Surface Soil	9/23/2008	VOCs/Metals/pH/ TOC/TS	Lead 119 J mg/kg (Dup: 157 J mg/kg)

Notes:

mg/kg = milligrams per kilogram

\* Exceedances were screened against the NJDEP Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and UPL95 Background Reference (10 background soil samples analyzed for TAL Metals).

<div>Summary of Previous Sampling Results</div> <div>Radiation Technology Superfund Site, Rockaway Township, New Jersey</div>					
Area: East Stand Area			Structure/Building: Pump House 3 (P-3)		
Historic Use: Water Pump House.					
Summary of Site Walk conducted on 10/25/12: Shed approximately 8'L X 8'W X 8'H. No PID readings above background. The shed is 2' X 4' fiberboard construction with corrugated aluminum or steel which contains piping, electrical, and two water tanks (each 60 gallons).					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances
No samples collected.					

Summary of Previous Sampling Results					
Radiation Technology Superfund Site, Rockaway Township, New Jersey					
Area: East Stand Area			Structure/Building: Pump House 4 (P-4)		
Historic Use: Water Pump House.					
Summary of Site Walk conducted on 10/25/12: Pump house (10'X12') made of galvanized sheet metal with steel framing and utilities. No pump was observed. No PID readings above background.					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances
Lockheed Martin 2005	UP-6	Soil	3/15/2005	PCBs	None

Summary of Previous Sampling Results					
Radiation Technology Superfund Site, Rockaway Township, New Jersey					
Area: East Stand Area			Structure/Building: R-2 (Test Stand 2)		
Historic Use: Rocket motor test stand					
Summary of Site Walk conducted on 10/25/12: Only concrete foundation remains, approximately 30' high on the SW side with one test bay. Observed 3' diameter corrugated galvanized pipes on each side through concrete. No PID readings above background.					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances*
CRA 2010	SB80B	Subsurface Soil	9/23/2008	VOCs/Metals/Energetics/TS	None
CRA 2010	SB80A	Surface Soil	9/23/2008	VOCs/Metals/pH/ TOC/TS	None
CRA 2010	SB84A	Surface Soil	9/25/2008	VOCs/Metals/pH/ TOC/TS	Cadmium 3.8 J mg/kg, Lead 73.8 mg/kg, Mercury 0.25 mg/kg, Silver 2.2 mg/kg

Notes:

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

\* Exceedances were screened against the NJDEP Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and UPL95 Background Reference (10 background soil samples analyzed for TAL Metals).

Summary of Previous Sampling Results					
Radiation Technology Superfund Site, Rockaway Township, New Jersey					
Area: East Stand Area			Structure/Building: R-3 (Test Stand 3)		
Historic Use: Rocket motor test stand with exhaust scrubber/effluent treatment.					
Summary of Site Walk conducted on 10/25/12: Only concrete base of test stand remains. Two tanks were observed on the north side of remaining concrete structure (estimated 500 gallon and 10,000 gallon, respectively).					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances*
Lockheed Martin 2005	R-3 (315-48, 315-49)	pipe insulation and wrapping	3/15/2005	PACM	10% to 40% Chrysotile
Lockheed Martin 2010	R-3 wall	Cystalline crust	3/24/2010	Energetics	None
CRA 2010	SB77B	Subsurface Soil	9/22/2008	VOCs/Metals/Energetics/TS	None
CRA 2010	SB78B	Subsurface Soil	9/22/2008	VOCs/Metals/Energetics/TS	None
CRA 2010	SB79B	Subsurface Soil	9/22/2008	VOCs/Metals/Energetics/TS	None
CRA 2010	SB77A	Surface Soil	9/22/2008	VOCs/Metals/pH/ TOC/TS	Manganese 687 mg/kg
CRA 2010	SB78A	Surface Soil	9/22/2008	VOCs/Metals/pH/ TOC/TS	None
CRA 2010	SB79A	Surface Soil	9/22/2008	VOCs/Metals/pH/ TOC/TS	None

Notes:

mg/kg = milligrams per kilogram

\* Exceedances for samples in Lockheed Martin 2010 and CRA 2010 reports were screened against the NJDEP Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and UPL95 Background Reference (10 background soil samples analyzed for TAL Metals).

**Summary of Previous Sampling Results**  
**Radiation Technology Superfund Site, Rockaway Township, New Jersey**

Area: **East Stand Area**

Structure/Building: **Test Stand 4 (R-4)**

Historic Use: Rocket motor test stand with altitude test chambers.

**Summary of Site Walk conducted on 10/26/12:** Test Stand 4 (R-4) is a large building with galvanized sheet metal steel, framing, and utilities. Test Stand 4 (R-4) was used for testing of developmental engines which used mixed hydrazine and nitrogen tetroxide. Remnants of instrumentation, one large rocket motor test room, four moderate size test rooms with drainage troughs discharging outside the building, and two small laboratories were observed during the site walkover. In addition, a 5 gallon bucket half full of what appears to be waste oil is located in one of the small laboratories. No PID readings above background. Observed 9X9 floor tiles in some rooms. There are numerous fluorescent fixtures throughout, and numerous concrete footings on the north side, extensive electrical panels in the central portion, and condensor and hot well (concrete vaults and settling tank vaults) to the northwest.

**Existing Data**

Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances*
Lockheed Martin 2005	R-4 vent	Paint chips	3/15/2005	Lead ICAP	120 mg/kg
Lockheed Martin 2005	R-4 wall	Paint chips	3/15/2005	Lead ICAP	6,000 mg/kg
Lockheed Martin 2005	R-4 (315-16, 315-18)	TSI in furnace and TSI outside furnace surface	3/15/2005	PACM	10% to 15% Chrysotile
Lockheed Martin 2005	R-4 (315-17)	Thermal brick	3/15/2005	PACM	None
CRA 2010	SB81B	Subsurface Soil	9/23/2008	Metals/Energetics/TS	None
CRA 2010	SB82B	Subsurface Soil	9/23/2008	Metals/Energetics/TS	None
CRA 2010	SB83B	Subsurface Soil	9/23/2008	Metals/Energetics/TS	None
CRA 2010	SB81A	Surface Soil	9/23/2008	VOCs/Metals/pH/ TOC/TS	None
CRA 2010	SB82A	Surface Soil	9/23/2008	VOCs/Metals/pH/ TOC/TS	Mercury 0.21 mg/kg
CRA 2010	SB83A	Surface Soil	9/23/2008	VOCs/Metals/pH/ TOC/TS	None

Notes:

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

\* Exceedances for samples in the CRA 2010 report were screened against the NJDEP Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and UPL95 Background Reference (10 background soil samples analyzed for TAL Metals).



## Summary of Previous Sampling Results

### Radiation Technology Superfund Site, Rockaway Township, New Jersey

Area: **East Stand Area**

Structure/Building: **R-21**

Historic Use: Instrument center/boiler house/sewage treatment center

**Summary of Site Walk conducted on 10/25/12:** Observed empty concrete tank stand on South side of building. Also observed 12X12 tiles inside building. The small (10'X10') room in the SW corner of the building contained approximately 25 drums (30 gallons and 55 gallons), several 5 gallon containers, and other debris such as paper files and filters. The interior door was blocked, the exit door was open during the site visit. PID reading was 0.4 ppm for the ambient air in the room containing drums, and 0 ppm in all other rooms. The building was setup like an observation bunker, the west side has thick concrete walls and "blast" windows. The north and east sides are below ground level. Floor on the west side has troughs in the floor that are clean in appearance and may have been used for routing utility lines. Beige 9X9 floor tiles were also observed on the floor.

#### Existing Data

Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances*
Lockheed Martin 2005	R-21 wall	Paint chips	3/15/2005	Lead ICAP	1,900 mg/kg
Lockheed Martin 2005	R-21 door	Paint chips	3/15/2005	Lead ICAP	5,500 mg/kg
Lockheed Martin 2005	R-21 (315-30, 315-31, 315-37, 315-40, 315-41, 315-42, 15-46, 315-47)	floor tile, ceiling tile, acoustcic tile wall ceiling, brown ceiling glue dots, white floor tile, mastic under white floor tile	3/15/2005	PACM	No asbestos detected
Lockheed Martin 2005	R-21 (315-32, 315-33, 315-34, 315-35, 315-36, 315-38, 315-39)	mastic, tiles, ceiling panels, and tile adhesive	3/15/2005	PACM	2% to 16% Chrysotile
Lockheed Martin 2005	R-21 (315-43, 315-44, 315-45)	fibrous black pipe, pipe insulation, and wrap	3/15/2005	PACM	8% to 15% Chrysotile
Lockheed Martin 2005	R-21 adjacent utility pole (UP-7)	Soil	3/15/2005	PCBs	None
CRA 2010	SB87A	Surface Soil	9/22/2008	VOCs/Metals/pH/ TOC/TS	Lead 68.2 J mg/kg (Dup: 75.7 mg/kg), Mercury 0.14 mg/kg (Dup: 0.13 mg/kg)

Notes:

mg/kg = milligrams per kilogram

\* Exceedances for samples in the CRA 2010 report were screened against the NJDEP Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and UPL95 Background Reference (10 background soil samples analyzed for TAL Metals).

Summary of Previous Sampling Results Radiation Technology Superfund Site, Rockaway Township, New Jersey					
Area: East Stand Area			Structure/Building: R-29		
Historic Use: Miscellaneous storage/document storage.					
Summary of Site Walk conducted on 10/25/12: Galvanized steel and 2'X4' construction approximately 20'X40' with steel framing and utilities. Contains 9X9 beige floor tiles, drywall debris, paper debris, and 5.5" floppy disks. No PID readings above background.					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances*
Lockheed Martin 2010	R-29 adjacent utility pole (UP-7B)	Oil	4/22/2010	PCBs	Aroclor-1260 at 120,000 ug/kg
Lockheed Martin 2010	R-29 adjacent utility pole (UP-7S)	Soil	4/22/2010	PCBs	None

Notes:

µg/kg = micrograms per kilogram

\* Exceedances were screened against the NJDEP Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and UPL95 Background Reference (10 background soil samples analyzed for TAL Metals).

Summary of Previous Sampling Results					
Radiation Technology Superfund Site, Rockaway Township, New Jersey					
Area: East Stand Area			Structure/Building: R-33		
Historic Use: No historic information was available.					
Summary of Site Walk conducted on 10/25/12: Insulated galvanized steel metal building (9'X12') with steel framing, utilities, and an air vent built into the roof. Building contained plastic grates/shelves and had a fire on the inside, the floor is covered with a small amount of charred debris. No PID readings above background. A 3'X8' concrete pad was observed on the north side of the building.					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances*
CRA 2010	SB91A	Surface Soil	9/22/2008	VOCs/Metals/pH/ TOC/TS	Lead 134 J mg/kg, Mercury 0.15 mg/kg

Notes:

mg/kg = milligrams per kilogram

\* Exceedances were screened against the NJDEP Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and UPL95 Background Reference (10 background soil samples analyzed for TAL Metals).

Summary of Previous Sampling Results					
Radiation Technology Superfund Site, Rockaway Township, New Jersey					
Area: East Stand Area			Structure/Building: R-51 and Fuel Oil Tank (T-51)		
Historic Use: Boiler house for R-4 activities and fuel oil tank.					
Summary of Site Walk conducted on 10/25/12: R-51 is a metal building which is empty except for office space remains, and piping from the fuel oil AST to the south. The fuel oil AST is 12-foot diameter, 16-foot-tall and surrounded by an earthen berm, adjacent to R-51. R-51 was historically used as a boiler house for R-4 activities, and includes the associated fuel oil AST (T-51). No PID readings above background.					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances*
Lockheed Martin 2005	315-50	TSI pipe insulation	3/15/2005	PACM	25% Amosite
Lockheed Martin 2005	315-51	TSI pipe insulation	3/15/2005	PACM	None
Lockheed Martin 2005	315-52	Tar around pipe	3/15/2005	PACM	4% Chrysotile
Lockheed Martin 2005	315-53	TSI pipe air cell	3/15/2005	PACM	45% Chrysotile
Lockheed Martin 2005	T-51 Work Bench	Wipe sample	4/7/2005	Asbestos TEM/ASTM D6480-99	None
Lockheed Martin 2005	T-51 Tank	Wipe sample	4/7/2005	Asbestos TEM/ASTM D6480-99	None
CRA 2010	SB88A	Surface Soil	9/24/2008	VOCs/Metals/pH/ TOC/TS	None
CRA 2010	T-51	Contents inside Tank	9/26/2008	VOCs/Metals/Energetics/pH	VOCs: 1,4-Dichlorobenzene 170 J ug/kg, Ethylbenzene 210 J ug/kg, Isopropylbenzene 990 J ug/kg, Styrene 74 J ug/kg, Xylene 2,600 J ug/kg Metals: Aluminum 95.0 mg/kg, Antimony 2.8 J mg/kg, Arsenic 5.3 mg/kg, Barium 94 mg/kg, Cadmium 0.73 J mg/kg, Calcium 21 J mg/kg, Chromium total 19.8 mg/kg, Cobalt 1.8 J mg/kg, Copper 22.0 mg/kg, Iron 103,000 mg/kg, Lead 160 mg/kg, Magnesium 137 J mg/kg, Manganese 454 mg/kg, Nickel 21.2 mg/kg, Potassium 57.9 J mg/kg, Silver 0.24 J mg/kg, Sodium 2,320 mg/kg, Thallium 0.050 J mg/kg, Vanadium 7.4 J mg/kg, Zinc 46.6 mg/kg
CRA 2010	SB88A	Surface Soil	9/24/2008	VOCs/Metals/pH/ TOC/TS	None

Notes:  
mg/kg = milligrams per kilogram  
µg/kg = micrograms per kilogram

\* Exceedances for samples in the CRA 2010 report were screened against the NJDEP Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and UPL95 Background Reference (10 background soil samples analyzed for TAL Metals).

Summary of Previous Sampling Results					
Radiation Technology Superfund Site, Rockaway Township, New Jersey					
Area: East Stand Area			Structure/Building: No. 2 Sewage Treatment Plant (called Cistern and Cistern/Pump in previous reports)		
Historic Use: Sewage Treatment					
Summary of Site Walk conducted on 10/25/12: Sewage treatment Unit No. 2 consists of a separator chamber and effluent tank. No PID readings above background. Previous reports mistakenly called the No. 2 Sewage Treatment Plant the Cistern/Cistern Pump.					
Existing Data					
Report	Sample Locations	Sample Type	Sample Date	Analyses	Exceedances*
Lockheed Martin 2005	Cistern	water	3/15/2005	TAL Metals/ Pesticides/PCBs/BNAs/VOCs/ Perchlorate	Barium 3.7 ug/L, Calcium 2,100 ug/L, Iron 2,100 ug/L, Magnesium 400 ug/L, Manganese 490 ug/L, Potassium 1,900 ug/L
Lockheed Martin 2005	Cistern/Pump	water	3/15/2005	TAL Metals/ Pesticides/PCBs/BNAs/VOCs/ Perchlorate	Barium 11 ug/L, Calcium 4,600 ug/L, Copper 7.2 ug/L, Iron 13,000 ug/L, Magnesium 1,000 ug/L, Manganese 860 ug/L, Mercury 0.34 ug/L, Potassium 5,100 ug/L, Zinc 10 ug/L
Lockheed Martin 2005	Cistern/Pump	sludge	3/15/2005	TAL Metals/ Pesticides/PCBs/BNAs/VOCs/ Perchlorate	Metals:Aluminum 150 mg/kg, Antimony 28 mg/kg, Arsenic 27 mg/kg, Barium 17 mg/kg, Calcium 460 mg/kg, Chromium 150 mg/kg, Cobalt 25 mg/kg, Copper 280 mg/kg, Iron 520,000 mg/kg, Lead 850 mg/kg, Manganese 2,100 mg/kg, Nickel 140 mg/kg, Thallium 5.2 mg/kg, Zinc 200 mg/kg BNAs: Phenanthrene 11,000 ug/kg, Fluoranthene 14,000 ug/kg, Pyrene 15,000 ug/kg, Benzo(a)anthracene 5,100 J ug/kg, Chrysene 7,800 ug/kg, Bis(2-Ethylhexyl)phthalate 25,000 ug/kg, Benzo(b)fluoranthene 6,200 J ug/kg, Benzo(k)fluoranthene 5,600 J ug/kg, Benzo(a)pyrene 5,900 J ug/kg, Indeno(1,2,3-cd)pyrene 2,700 J ug/kg, Benzo(g,h,i)perylene 3,100 J ug/kg VOCs: Acetone 470 ug/kg, Carbon disulfide 7.0 ug/kg, 2-Butanone 110 ug/kg, Toluene 5.6 ug/kg Pesticides: p,p'-DDE 25 ug/kg, Dieldrin 8.6J ug/kg
Lockheed Martin 2005	Cistern/Pump	paint chip	3/15/2005	Lead ICAP	280 mg/kg
CRA 2010	SB79	subsurface soil	9/22/2008	Energetics/metals/TS/VOCs/pH/ TOC	None

Notes:

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

\* Exceedances for samples in the CRA 2010 report were screened against the NJDEP Residential Direct Contact, NJDEP Non-Residential Direct Contact, NJDEP Impact to Groundwater Soil Remediation, and UPL95 Background Reference (10 background soil samples analyzed for TAL Metals).

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**Photographs of Site  
Buildings/Structures from October  
2012 Site Walk**

P-2 Area



**Date/Time:** 10/25/2012

**Subject:** Acid storage area in P2 Area. At north end (foreground of photo) is well with heat tape and spigot.



**Date/Time:** 10/25/2012

**Subject:** Acid storage area in P2 Area.





**Date/Time:** 10/25/2012 **Subject:** Fuel storage area looking south.



**Date/Time:** 10/25/2012 **Subject:** Fuel storage area looking north.





**Date/Time:** 10/25/2012 **Subject:** South side of igniter building (entrance).



**Date/Time:** 10/25/2012 **Subject:** Interior of igniter building.





**Date/Time:** 10/25/2012 **Subject:** Building located in P2 Area.



**Date/Time:** 10/25/2012 **Subject:** Interior of building located in P2 Area.





**Date/Time:** 10/25/2012 **Subject:** Rear of paint storage area in P2 Area.



**Date/Time:** 10/25/2012 **Subject:** Interior of paint storage building in P2 Area.





**Date/Time:** 10/25/2012 **Subject:** Interior of building R-34 located in P2 Area.



**Date/Time:** 10/25/2012 **Subject:** Exterior of building R-34 located in P2 Area.





**Date/Time:** 10/25/2012 **Subject:** Exterior of building R-43 located in P2 Area.



**Date/Time:** 10/25/2012 **Subject:** Interior of building R-43 located in P2 Area.





**Date/Time:** 10/25/2012 **Subject:** Exterior of building R-47 in P2 Area.



**Date/Time:** 10/25/2012 **Subject:** Interior of building R-47 in P2 Area.  
Numerous 55 gallon drums present.

South Stand





**Date/Time:** 10/25/2012

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**Subject:** Looking northwest at propane storage area  
within the South Stand Area.

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**Date/Time:** 10/25/2012 **Subject:** View to the west northwest of Building S-11.



**Date/Time:** 10/25/2012 **Subject:** View of the south side of Building S-11.





**Date/Time:** 10/25/2012

**Subject:** View of south side of Building S-12.





**Date/Time:** 10/25/2012

**Subject:** Lower portion of the backside of Building S-12.





**Date/Time:** 10/25/2012 **Subject:** View of the northeast side of Building S-37.



**Date/Time:** 10/25/2012 **Subject:** Northeast section of Building S-46.



**Date/Time:** 10/25/2012 **Subject:** Exterior of Building S-46.





**Date/Time:** 10/25/2012 **Subject:** Concrete pad to the north of Building S-48.





**Date/Time:** 10/25/2012

**Subject:** Debris pile containing cinder blocks, metal, wood, etc. at S-49.



**Date/Time:** 10/25/2012

**Subject:** View of remaining concrete wall at S-49.





**Date/Time:** 10/25/2012

**Subject:** View to the south of sewage treatment area  
within the South Stand Area.



**Date/Time:** 10/25/2012

**Subject:** Looking north from the downgradient side of  
the sewage treatment area.

East Stand





**Date/Time:** 10/26/2012

**Subject:** View from southeast of agitator and effluent treatment basin and containment area.



**Date/Time:** 10/26/2012

**Subject:** Containment area around agitator and effluent treatment basin with chute exiting to top of photo.





**Date/Time:** 10/26/2012 **Subject:** Possible cisterns due east of R-47 in East Stand Area.

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**Date/Time:** 10/26/2012 **Subject:** Close-up of possible cistern due east of R-47 in East Stand Area.

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**Date/Time:** 10/26/2012  
**Subject:** Cooling tower (east side) within the East Stand Area.



**Date/Time:** 10/26/2012  
**Subject:** Interior of cooling tower within the East Stand Area.





**Date/Time:** 10/25/2012 **Subject:** Openings in top of scrubber.



**Date/Time:** 10/25/2012 **Subject:** Concrete basin within scrubber.





**Date/Time:** 10/25/2012

**Subject:** East Stand Area sewage treatment. (Identified in reports as cistern/cistern pump).



**Date/Time:** 10/25/2012

**Subject:** East Stand Area sewage treatment. (Identified in reports as cistern/cistern pump).





**Date/Time:** 10/25/2012

**Subject:** Exterior of pump house P-3 in the East Stand Area.





**Date/Time:** 10/25/2012

**Subject:** Interior of pump house P-3 in the East Stand  
Area. Water tanks visible.



**Date/Time:** 10/25/2012 **Subject:** Exterior of pump house P-4 in the East Stand Area.



**Date/Time:** 10/25/2012 **Subject:** Exterior of pump house P-4 in the East Stand Area. Water towers in background.





**Date/Time:** 10/25/2012

**Subject:** Looking down from top of test stand #2 (R-2).



**Date/Time:** 10/25/2012

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**Subject:** Looking up at concrete walls of test stand #2  
(R-2).

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**Date/Time:** 10/25/2012

**Subject:** Exterior of test stand #3 (R-3).



**Date/Time:** 10/25/2012

**Subject:** Exterior of test stand #3 (R-3).





**Date/Time:** 10/26/2012      **Subject:** Concrete footing located within R-4.



**Date/Time:** 10/26/2012      **Subject:** Trough exiting the interior of R-4.



**Date/Time:** 10/26/2012 **Subject:** Trough exiting the interior of R-4.





**Date/Time:** 10/25/2012

**Subject:** Southwest room in R-21 with multiple 55 gallon drums.



**Date/Time:** 10/25/2012

**Subject:** Southwest room in R-21 with multiple 55 gallon drums.





**Date/Time:** 10/25/2012

**Subject:** Interior wall of building R-29.



**Date/Time:** 10/25/2012

**Subject:** Exterior of building R-29.





**Date/Time:** 10/25/2012

**Subject:** Exterior of building R-33.



**Date/Time:** 10/25/2012

**Subject:** Concrete pad adjacent to building R-33 along north side.





**Date/Time:** 10/25/2012

**Subject:** Exterior of building R-51 in the East Stand  
Area.



**Date/Time:** 10/25/2012

**Subject:** Exterior of building R-51 in the East Stand  
Area. Tank T-51 to the east of R-51.





**Date/Time:** 10/25/2012

**Subject:** Transformer bank area due east of R-4 within the  
East Stand Area.





**Date/Time:** 10/25/2012

**Subject:** Drums located in waste disposal area (north end).



**Date/Time:** 10/25/2012

**Subject:** South end of waste disposal area.